VOL. XXVII. No. 5 MAY 1942

MECCANO MAGAZINE

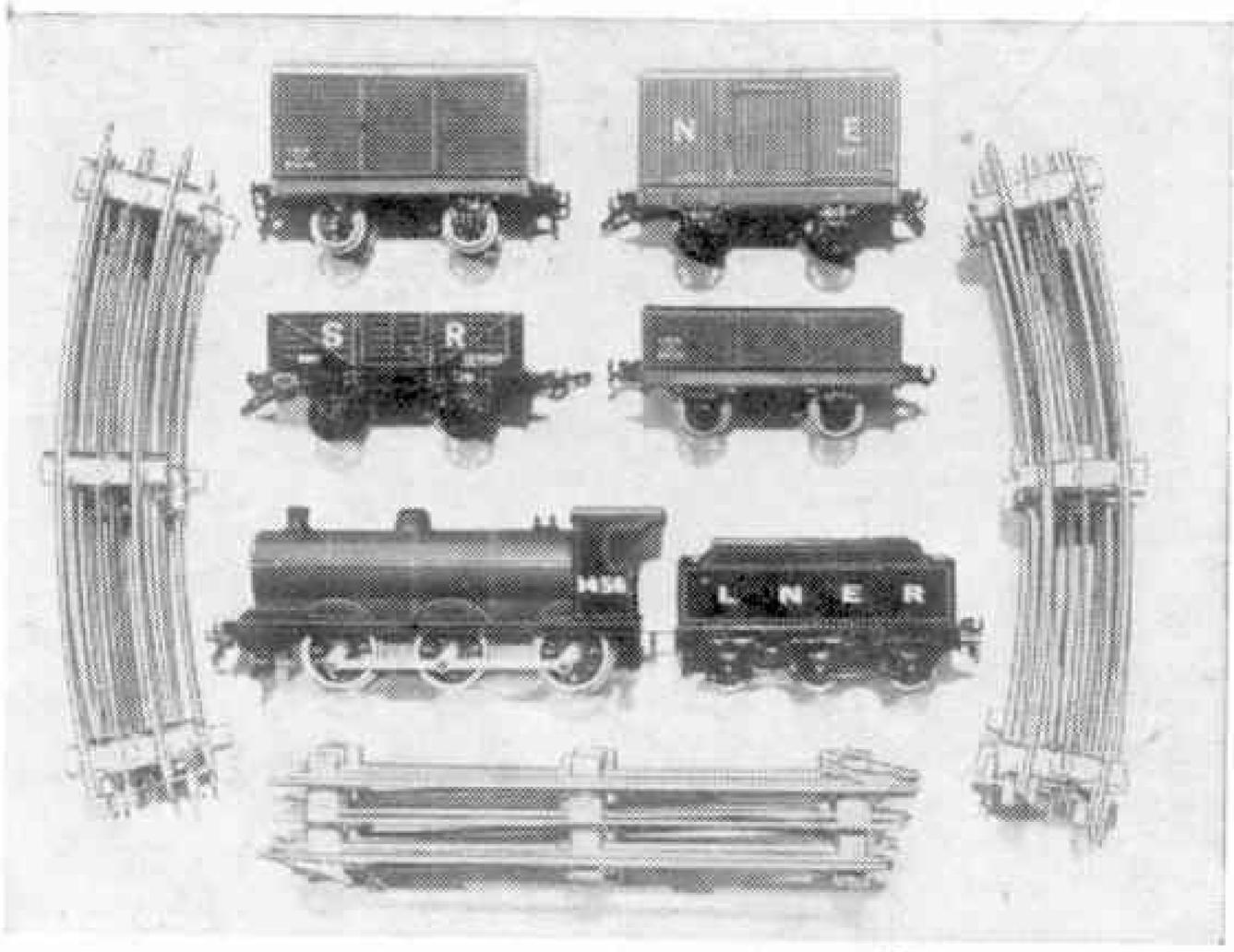
THE HOME LEDGE

6d.

GAUGE "0" WARTIME OFFER

ALL model railway owners will know that the production of models containing metal, for private use, is now forbidden by the Government.

However, we are pleased to announce that WHILE OUR STOCK LASTS we can offer the gauge "0" outfit illustrated (see details).



1 L.N.E.R. 6-coupled Goods Locomotive and Tender (fitted with junior permag mechanism 6-8 volts d.c.), 4 assorted Goods Vehicles (two open and two covered), 12 tinplate curved Rails (fitted with centre rail for 4 ft. dia. circle), 5 straight Rails and 1 Connecting Rail (to make an Oval Track).

£3 12s. 6d. including Purchase Tax and carriage free to any address in the U.K.

YOU can run this outfit off accumulators. If Dad's car is laid up for the duration, why not borrow his accumulator? Rectifiers and transformers are not available in wartime.

Model Railway Scenery for Gauge "0" and Gauge "00" Railways. Specially designed backgrounds (36 in. x 9½ in.) depicting 1. Pastureland. 2. Sea Coast, and 3. Mountains. 2/3 per sheet. Postage 1d. (6/9 the set).

BASSETT-LOWKE LTD., NORTHAMPTON

LONDON: 112, High Holborn, W.C.1
MANCHESTER: 28, Corporation St.

SUMMER - 1942

Even if it is wartime there is still the need for games in the open air. Cricket will be played in all sorts of places during the long hours of daylight, and Tennis too. Hamley's still have a very good selection of everything you need for Summer Sports at reasonable prices.

CRICKET BATS from **9/6** to **32/6** each.
CRICKET BALLS from **1/3** to **12/6** each.
TENNIS RACQUETS — All leading makes from **42/-** to **95/-** each.

OUR ONLY ADDRESS:

Hamley's
HAMLEY BROTHERS LTD

200-202, REGENT STREET, LONDON W.1

Tel. REG. 3161

During the National Emergency only limited supplies of

VITALITY BULBS

are now likely to be available.

If your Dealers cannot supply you with the type you require, do let us have full particulars, together with their name and address, because it might just happen that we know of factors who may be able to supply them.

VITALITY BULBS LTD

NEVILLE HOUSE, NEVILLE PLACE, WOOD GREEN, LONDON, N.22

Post Free OFFER of SAMPLE PARCEL containing many useful pieces of

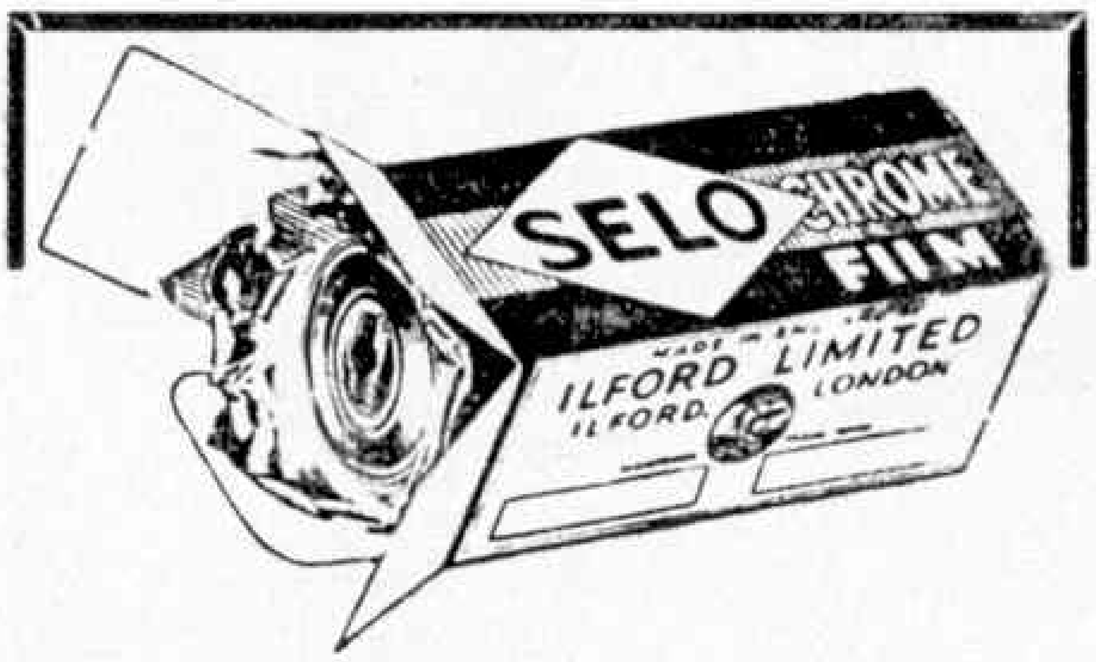
CHEMICAL APPARATUS

3'6

Write also for free PRICE LIST of other sets.

BECK (Scientific Dept. G), 60, High St. Stoke Newington, London N.16

FROG
SCALE
MODEL
AIRCRAFT
TRADE MARK
REGD.
MADE IN ENGLAND BY
INTERNATIONAL MODEL AIRCRAFT LTD
for the Sole Concessionaires
LINES BROTHERS LTD·TRI-ANG WORKS·MORDEN ROAD·MERTON·LONDON·S·W·19·ENG



There is not enough SELO FILM to-day to meet the big demand, but if you are fortunate enough to obtain some you may be sure of getting the finest possible results, for these famous British films are still the best in the world.

All available supplies are being distributed through the usual Trade channels.

SELO

FILMS MADE BY ILFORD

ILFORD LIMITED, ILFORD, LONDON

The "WINSTON"

A Sure Winner

PREMIER of the SKIES

A Wakefield Type 50-inch Span Flying Model

Complete Kit, including Plan & Printed Sheets, 19/9 Post Free

Plan and Printed Sheets only, 3/6 Post Free

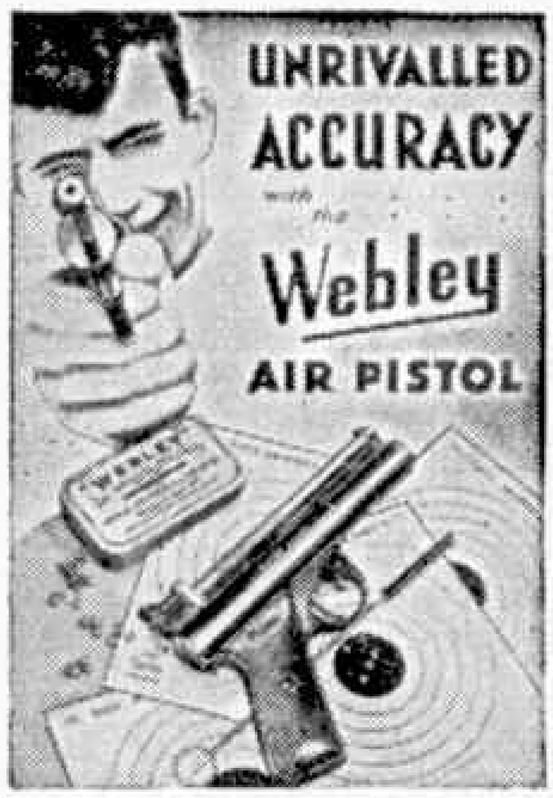
SPITFIRES, HURRICANES, Etc., Etc.
Flying Models, from 4/6 Post Free

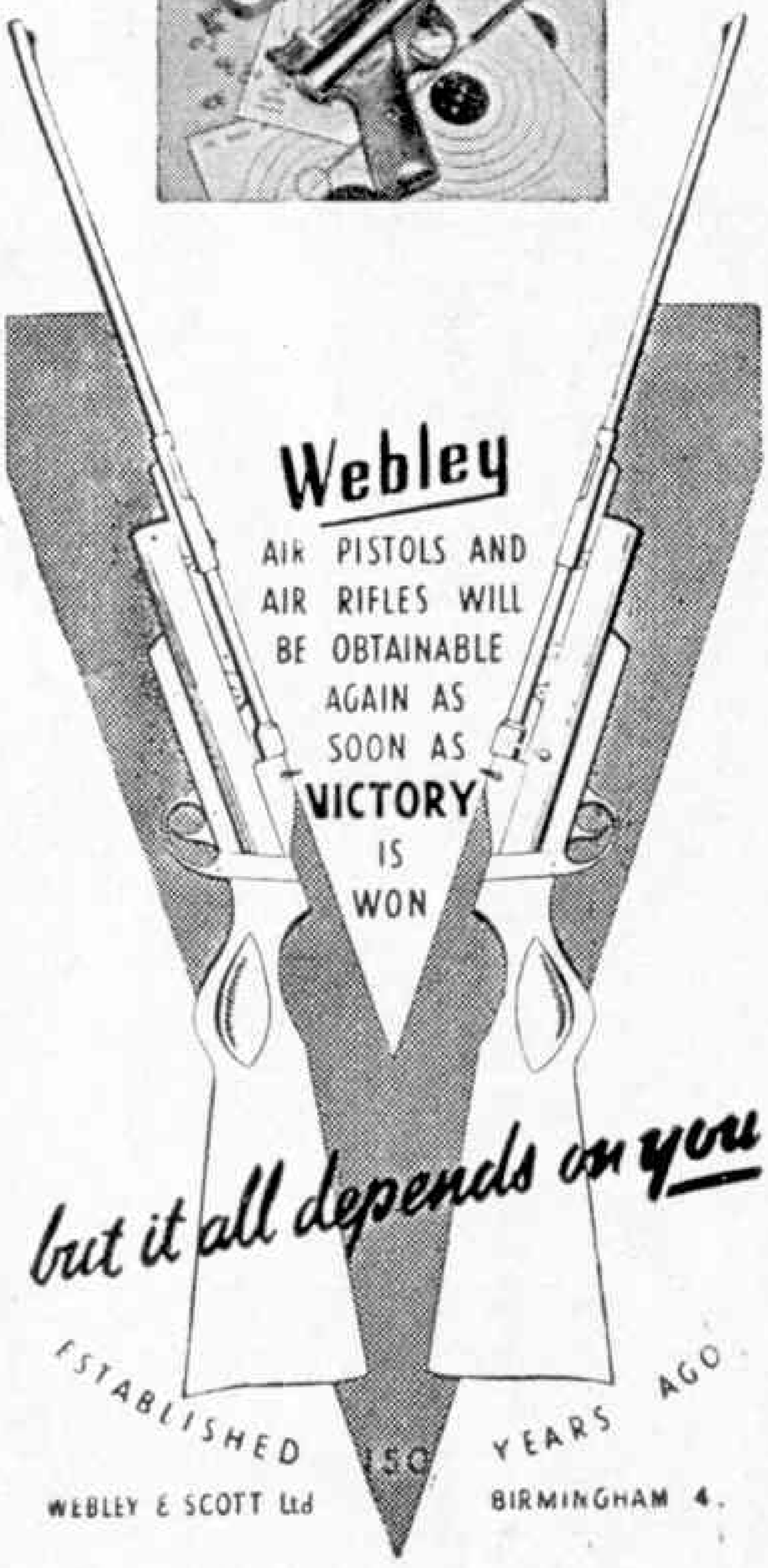
16-inch Span Flying Models from 2/- Post Free

SEND 3d. for NEW CATALOGUE illustrating a FULL RANGE OF KITS

ELITE MODEL AIRPLANE SUPPLIES
14. Bury New Road, MANCHESTER 8

Good News!





TRI-ANG

ALL BRITISH TOYS

LOOK OUT FOR THESE TRADE MARKS

TRI-ANG TOYS

FROG
MODEL
AIRCRAFT

DOLLS

JUVENILE CYCLES
TRICYCLES
FAIRYCYCLES

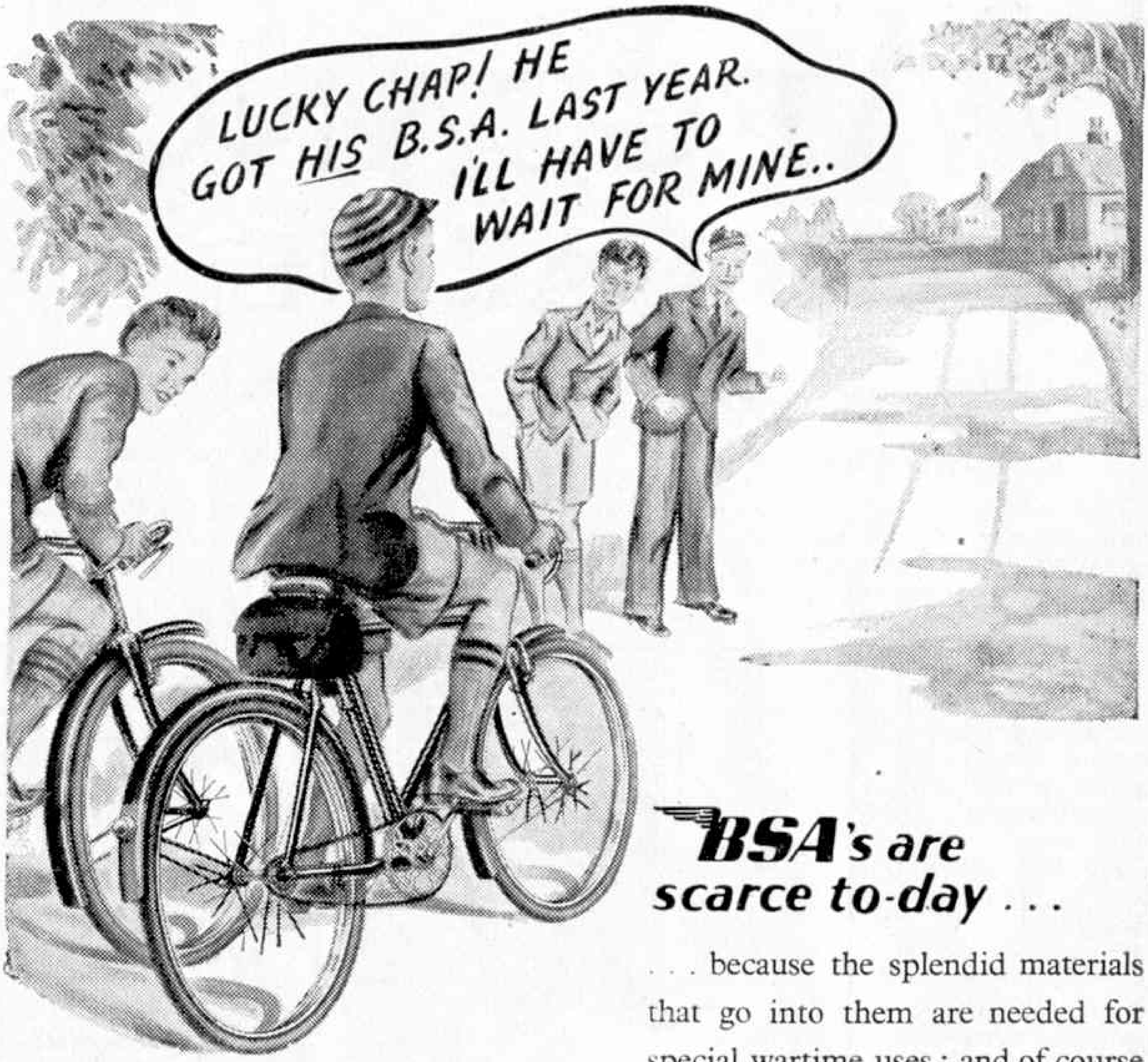
Pedigree Pets

Hygienic
SOFT TOYS

LINES BROS. LTD.

AND SUBSIDIARY COMPANIES
Unique & Unity Cycle Co. Ltd., Pedigree Soft Toys Ltd.
International Model Aircraft Ltd.

TRI-ANG WORKS, MORDEN ROAD, LONDON S.W.19



Of course a BSA is the Bicycle you want your Dad to give you!

BSA's are scarce to-day . . .

. . . because the splendid materials that go into them are needed for special wartime uses; and of course munition workers must have first chance of those that *are* being made. We know you won't mind waiting a while for *your* B.S.A.—you'll find it well worth waiting for. A B.S.A. stays shiny-new much longer, and every single part is perfectly finished.

You can still have a free catalogue if you write to:—

Dept. M1/5, B.S.A. CYCLES LTD., BIRMINGHAM 11.

Next Month: CAPT. WHITMAN WRITES ON WAR CONTRASTS. Ready: 1st June

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

Vol. XXVII
No. 5
May 1942

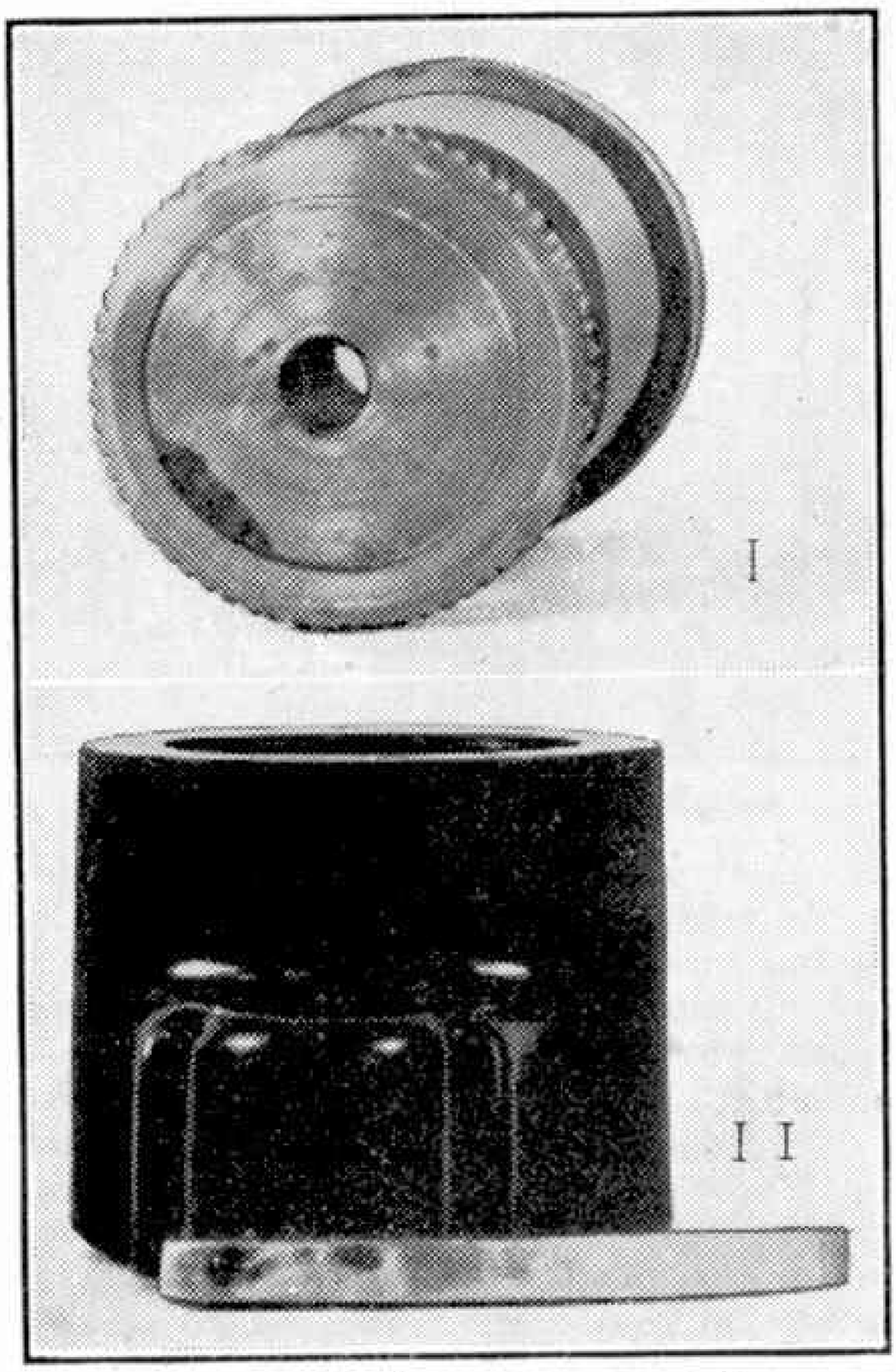
With the Editor

Puzzle Pictures

This month I start a new series of Puzzle Picture competitions. The first will consist of six photographs of objects that should be recognisable by every reader after careful scrutiny. The pictures are quite straightforward and have not been faked in any way. Two appear on this page, two others will be published next month, and the final two in the July issue.

Prizes will be awarded to readers who identify the six pictures correctly. Entries must be sent in after the appearance of the third set of pictures, in the July issue, in which further details of the competition will be given.

Make a note of your solutions each month, *but do not send them in until the competition is finished.*



May Puzzle Pictures Nos. I and II

Supplies of the "M.M."

I still receive letters from readers telling me of their disappointment when they are unable to obtain the "*M.M.*" The position is that the number of copies of each issue that can be printed has had to be still further reduced, owing to more severe paper restrictions, and rationing of supplies has been found necessary. For this reason I am unable to accept new direct orders or subscriptions, and every available copy is sent out to meet as far as possible the needs of readers who have placed regular orders with their dealers or news-agents.

Many readers overcome the difficulty by sharing their copies with friends who are unable to obtain the "*M.M.*" In doing so they help me and themselves.

Next Month

I have already announced that next month's cover will be a striking picture of a Curtiss P40E fighter in flight. The accompanying article will describe the development of the fine P40 fighters, or pursuit ships as the Americans call them. Included in the series are the "Tomahawks" and "Kittyhawks" that have done such great work with the R.A.F. There will be also a fine article by Captain J. E. A. Whitman on some contrasts between this war and that of 1914-18 and a splendidly illustrated description of gears and how to identify them.

An Island Bird Sanctuary

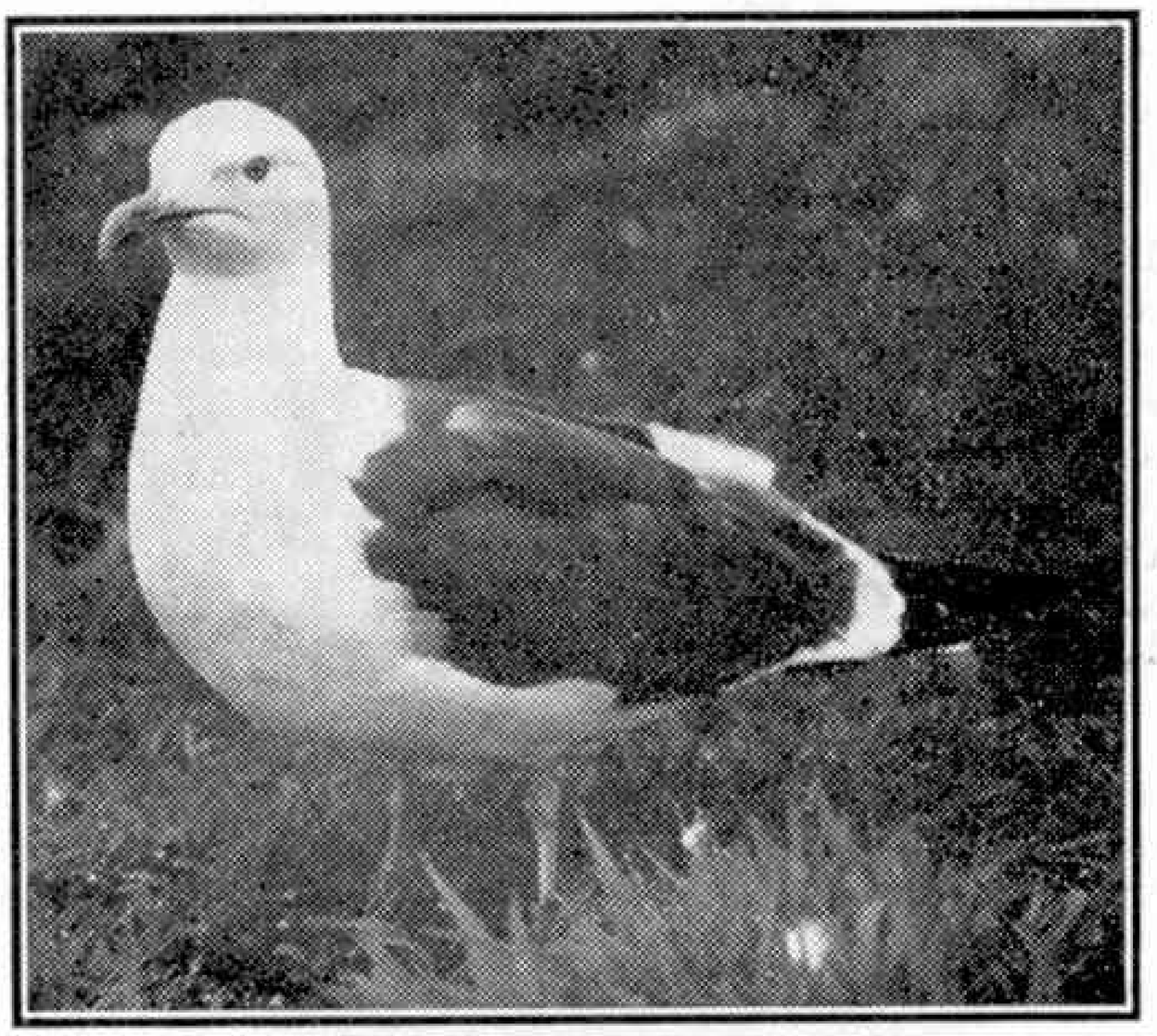
By H. Auger

ISLAND — what thoughts immediately spring to our minds at the very mention of the word! The adventurer, the lover of the wild, and those who would escape the timetable rush of modern civilisation, all dream of islands, the ideal small, self-sufficient island—the sanctuary. From the point of view of man these are indeed rarities; but from the point of view of a bird, not possessing man's twentieth century exactitude, such places do exist in adequate numbers throughout the world, and Britain provides more than a few of them.

The adoption of any island by a bird as its home during the nesting season depends mainly on its proximity to the staple food supply. Topographical features also single out to what species the particular island will appeal. The extent and variety of vegetation also bear on the selection, and the bird capacity of the island is decided by the number of suitable nesting sites. It is true that many similar sites on the mainland offer to the birds all the material advantages the islands can provide, but in many cases these are almost deserted. The reason for the choice of islands is best known to the birds.

A true bird sanctuary is a place where the birds are free from all the perils of man, with the added protection that man may be able also to provide against their enemies. These enemies to a sanctuary may be vermin or some undesirable other species of bird; and the island sanctuary, because of its isolation, lends itself more easily than its mainland counterpart to protective measures. Several of the islands round our coasts now given over entirely or partially to birds are supported by one of the Trusts, or in some cases by private individuals. Man's gradual withdrawal from many of our smaller island outposts is resulting in greater freedom of movement of the feathered population in these places, so that in time they become natural sanctuaries.

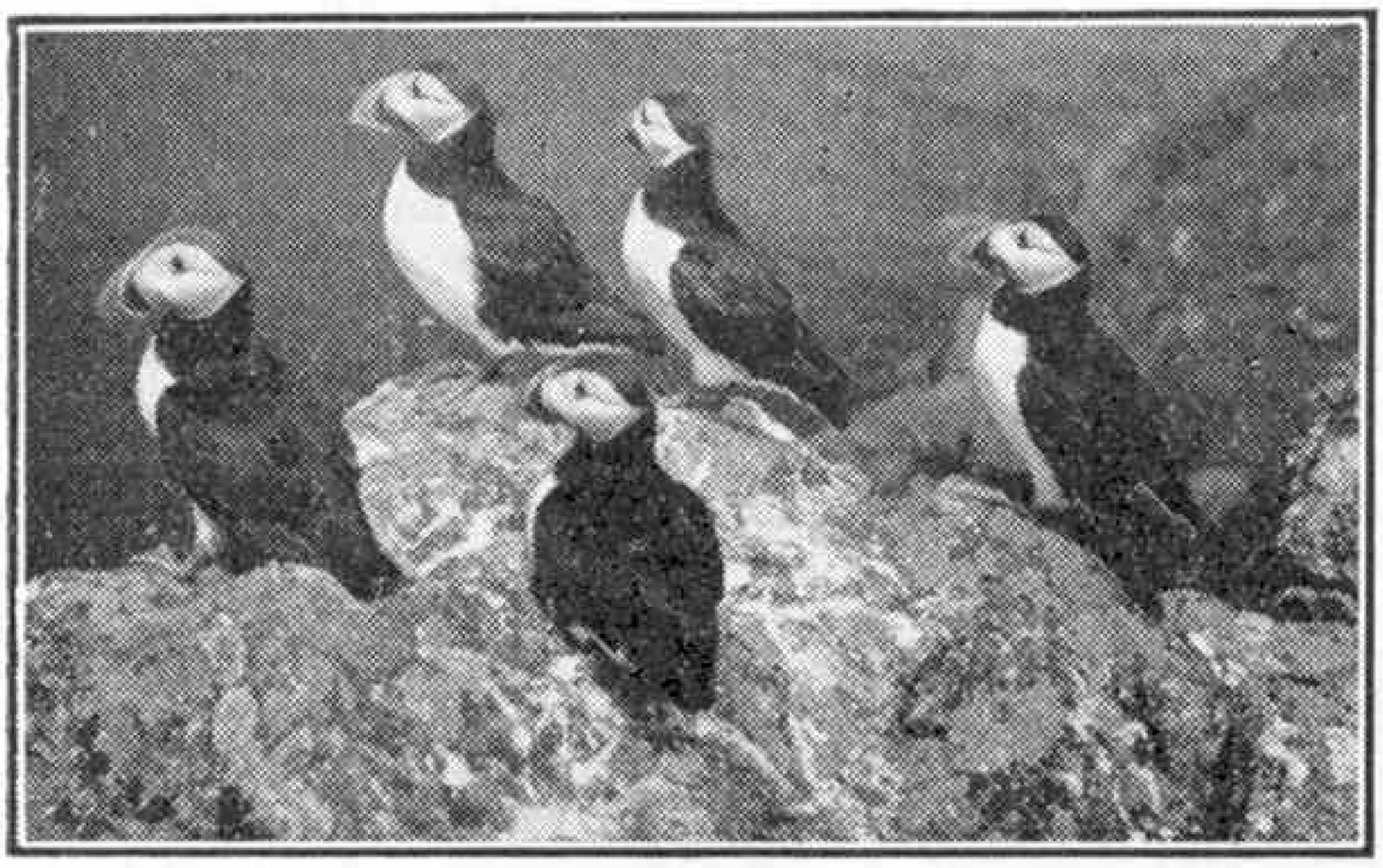
Several of these islands, upheld by the efforts of individuals, lie off the coast of Pembrokeshire, and it was on one of these that the following observations were made and the photographs taken. The coastline of the island is composed entirely of rocky cliffs, in some places sheer from sea to ridge, in others shelving upward and joining the surface with a steep slope covered with humps of thrift. Seen from the mainland the island is uninviting; the cliffs look sheer all round, the surface flat, and the colour a drab grey; not the slightest hint of the mass of life and glorious colour that is to be seen at closer quarters.



Lesser Black-backed Gull approaching nest.

Not until the boat carrying the visitor draws in close are the birds visible, just one or two at first, then small flocks. Finally, as one of the cliff-bound bays is crossed, the number of birds floating around is seen to be uncountable. As the boat cuts across the bay, several birds, near by, flutter and run on the surface of the sea to a safer distance; others merely dive to avoid the boat. The majority of these birds are of the Auk tribe—puffins, razorbills and guillemots, with an occasional prowling greater black-backed gull wistfully stalking the puffins. The air, too, is thick with more energetic birds of the same species, all busy going to or from feeding themselves or their families.

On landing, a steep narrow path cut in



The Home Guard! Group of Puffins on one of their meeting rocks.

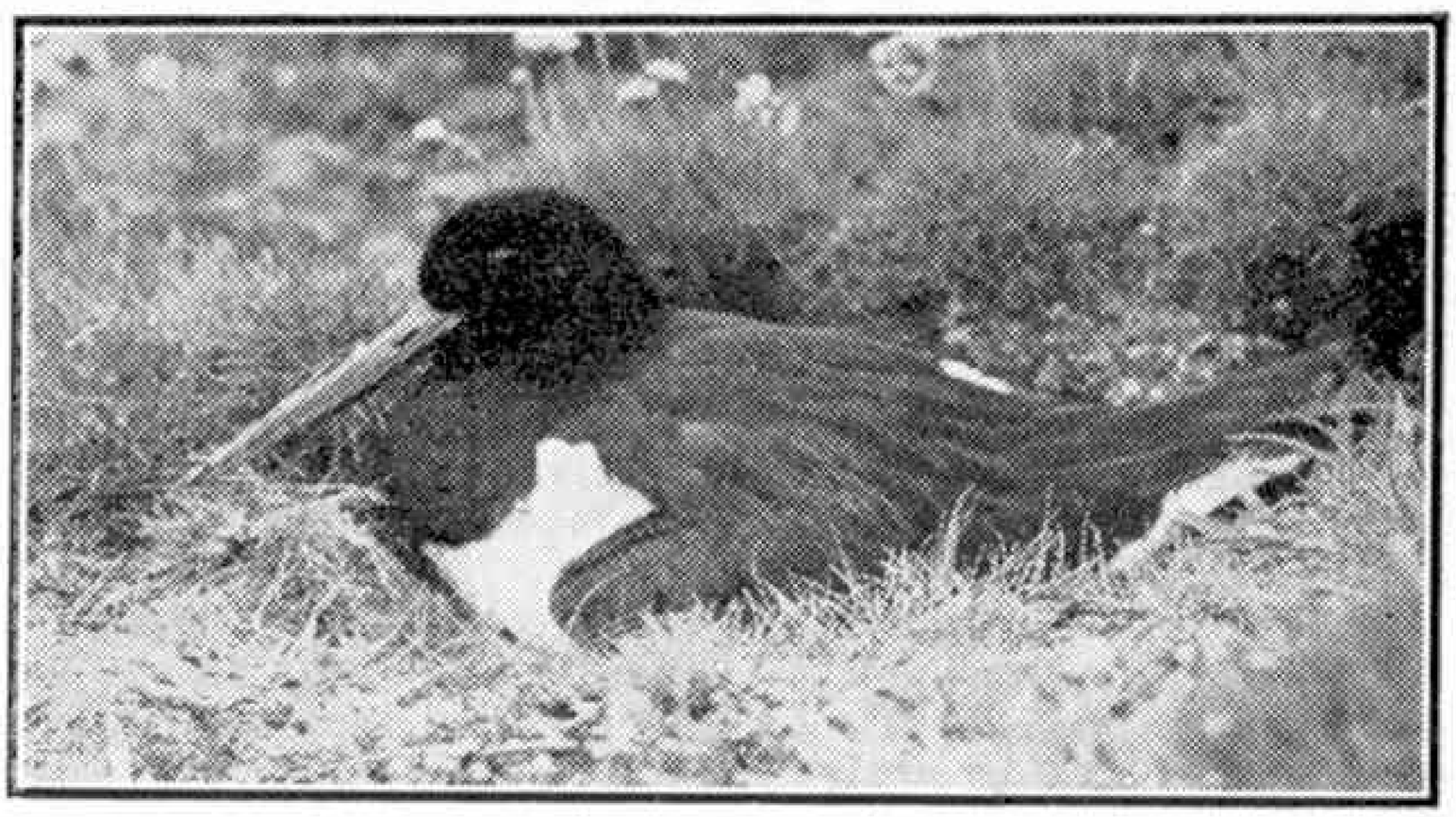
the cliff side leads to the top of the island. In the steep ground flanking both sides of the path are hundreds of burrows, many of which, judging by the birds that are continually streaming from them, belong to puffins. Above this ground on a fine evening the sky is so thick with these stumpy birds on their rapidly vibrating wings that they resemble a cloud of midges over a pond.

The surface of the island is divided by a series of ridges of bare rock into a number of parallel valleys, each with a stream in the bottom. The highest points of these ridges are selected by the greater black-backed gulls as nesting sites, and their commanding positions admirably suit these majestic gulls. Fine as this great gull is to watch, his lust for killing is the terror of all the sanctuary, with the result that steps are taken to keep his numbers under control.

The valleys provide an excellent variety of cover for many species of birds, there being large areas of rough heather, bracken, coarse grass, thrift, and, what catches the visitor's eye most, acres of giant bluebells. Scattered among these are several colonies of lesser black-backed gulls, numbering several hundred nests in all. These gulls fill the air and create a great clamour the whole time the colony is being trespassed, while their small chicks crouch motionless, as in this attitude their protective markings offer the best defence.

Throughout the areas not occupied by the gulls, oyster-catchers have their nests; and although they nest singly and not in colonies like the gulls, there is always at least one pair in sight. The sharp, staccato cries, and the contrasting black and white plumage, both help to advertise the presence of these wary waders. Although the chicks of these birds are more difficult to find than the gull chicks, the parents go almost frantic as they shriek low overhead. A passing gull also may draw the alarm cry from a pair of oyster-catchers, but here the noise is followed up by vigorous and effective attacks, although the gull may have no intentions on the chicks. Another wader, who chases the gulls and is a neighbour of the oyster-catcher, is the curlew, whose wild cry harmonises with the island scenery.

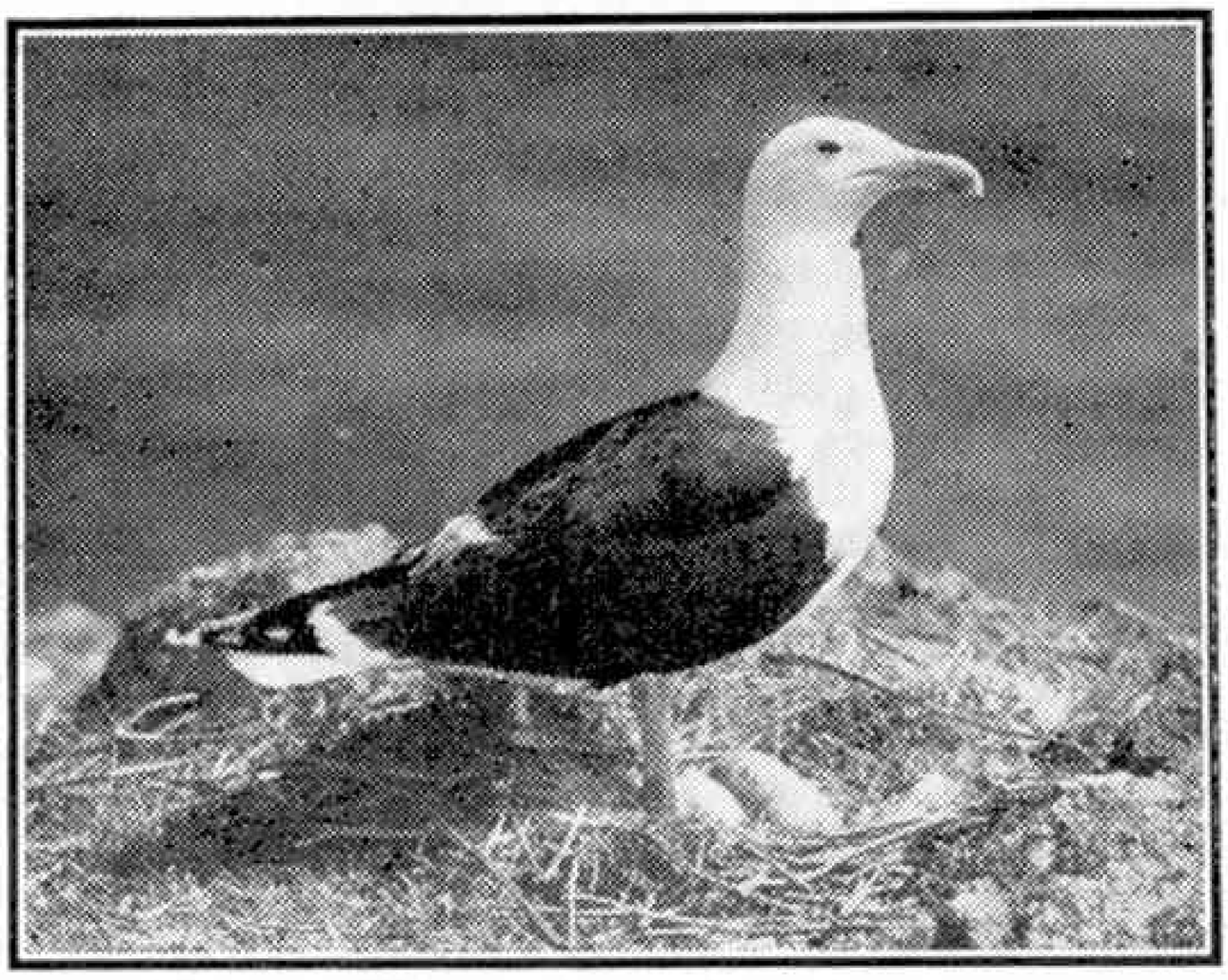
Almost insignificant among so many larger birds are the three most common of the smaller inhabitants, the wheatear,



Oyster-Catcher brooding.

the stonechat and the rock pipit. These three, as if not to be missed, are continually hopping up in the path of the visitor, yet their nests are difficult to locate, the heather where the rock pipits and stonechats nest being so thick as to make the crushing of the nest highly probable in a search. The wheatear on the other hand safeguards its nest by building under a rock or down a rabbit burrow, the only clue to its whereabouts being given by the parents entering or leaving the entrance.

After we cross the island and approach the seaward cliffs, the thrift-covered ground drops away steeply to the cliff edge. Here the ground is thick with burrows, so undermining the surface as to demand caution in placing our feet, yet few birds are to be seen, only a few puffins. To all intents and purposes the holes appear deserted, although here and there freshly moved earth can be seen. A visit to this spot in the middle of the night gives a vastly different impression, however, the air resounding with the dove-like calls and the swish of wings from fast-moving birds. These are the Manx shearwaters, visiting or exchanging duties with their sitting mates, a continuous stream of them entering and leaving the honeycombed ground. As the hosts of dim shapes hurtle past it is difficult to imagine how they manage to avoid colliding, yet their speed would suggest that they see as clearly as other birds do in daylight. This high-speed blackout merry-go-round lasts for about two hours; and then, as with an air raid, before the first streaks of dawn appear peace reigns again, the sitting birds are back in the burrows and the others well out to sea.



Defiance! Greater Black-backed Gull.

The greatest dread of the shearwater is the greater black-backed gull when, on a windless night, the shearwater owing to its difficulty in taking off becomes an easy prey. The heavy toll taken in this manner is grimly shown by the number of oily corpses lying around the colony. The shearwaters, with their black backs merging into white fronts, are the most peculiar and intriguing birds in the whole of the sanctuary.

Another resident on the island with similar nocturnal habits to the shearwater, although not present in such numbers, is the small storm petrel. Like the former bird, which also is a member of the petrel family, it displays the characteristic tubular nostrils on top of the upper mandible. These bat-like creatures nest under loose rocks and in the numerous dry-stone walls. Among its other distinctions, the storm petrel is the smallest British bird with webbed feet, being no larger than a swift, and is the last bird in the season to lay its single egg.

The various types of cliff are so methodically selected by the birds that build their nests on them that it is possible to forecast the occupying species of any stretch of cliff from quite a distance. The herring gulls choose the sloping, irregular cliffs, particularly where the rocks are interspersed with patches of grass or thrift. Here, as at any gull colony, whatever the species, the tresspasser is greeted by all the birds taking the air and loudly voicing their protest. The very neat substantial nest is usually placed in the natural trough of a rock, and when holding its three eggs it is an attractive sight. The adult gulls, here in their best and whitest plumage, contrast sharply with those of the same species seen grubbily seeking food in some dirty harbour. The chicks of these birds leave the nest as soon as they are dry, and astound the watcher by their ability to flatten themselves into invisibility among the rocks, or their toughness to withstand a drop of several feet to the ledge below. By far the vast majority of this species nest on the cliffs, but a few intermix with the larger colonies of lesser black-backed gulls.

Where the cliff is crumbling, and boulders with their accompanying holes and fissures are plentiful, so too is the razorbill. Some of these auks will lay their single large egg on an open cliff ledge, but their preference is for the cover and security of a hole. The deep bill is very efficient at catching fish, as it is also at nipping the fingers of anyone placing his hand too near the sitting bird! During a hot day rows of razorbills growling continuously, stand on the top of the boulders covering their sitting (*Continued on page 194*)

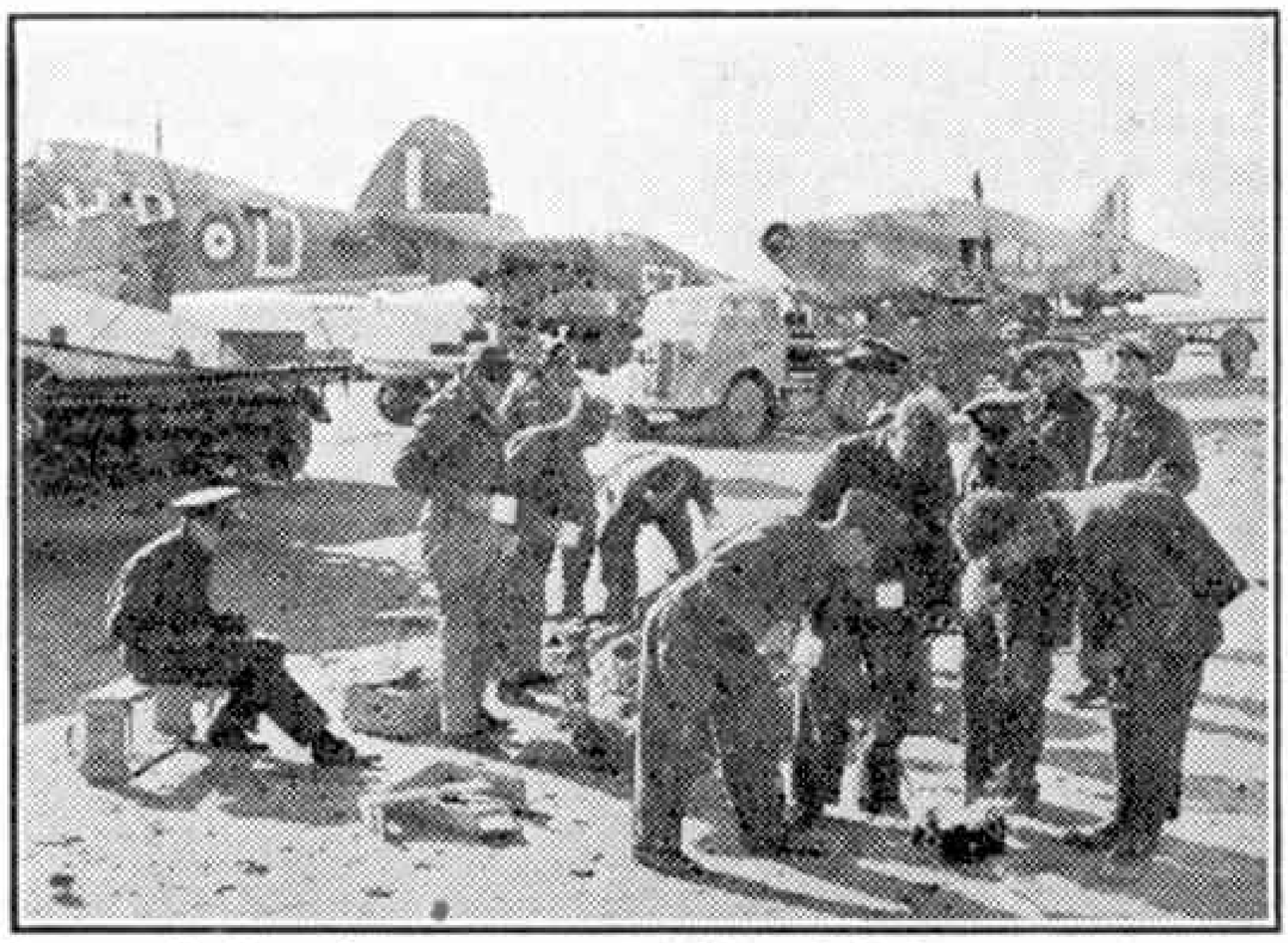
R.A.F. Desert Salvage Crews

"THEY also serve who only salve—" might well be the motto of the Repair and Salvage Units of the Royal Air Force in the Middle East. Their job is to locate crashed aircraft in the wastes of the Western Desert and to bring them back to base where, in a short time, the twisted wrecks are transformed back into fighting machines.

The task is a hard one. No Aladdin's lamp of modern engineering can do away with the long hours of re-assembling and refitting. Skilled officers and airmen who are engaged on this important duty are as busy as the aircraft workers in the factories of Great Britain. The wrecks are methodically dismantled, the hundreds of component parts carefully examined, then repaired or replaced, and the whole aircraft rebuilt. Many a fighter and bomber has regained its squadron after treatment; and many a victory over Junkers and Messerschmitt has been gained by an aircraft once a crumpled mass of fuselage, wings and engine, and with propeller blades incongruously bent or dug into the stones and sand of the desert.

Toughest task falls to the personnel of the picturesque convoys that set out into the wilderness for perhaps more than a hundred miles over desolate and featureless terrain to locate a reported crash often with nothing more than a compass bearing to help them.

All the hardships of the desert are theirs. There are no water points, no food and supply centres and no refuelling facilities. The convoy goes out self-contained. In soft sand the huge trucks sink to their axles and may have to be dug out. Sometimes the vehicles have to jolt their way for miles over rocky outcrops which play havoc with springs and tyres.



Personnel of a salvage convoy stretching their legs and refreshing themselves far out in the desert.

Worst of all are the vagaries of weather. For days at a time the whole convoy will be hove to and immobilised in a blinding sandstorm. Sudden rainstorms turn the surface of the desert into a sea of treacherous mud. Over and above all this there is always the prospect of meeting an enemy patrol. Salvage convoys have not infrequently been attacked by foraging enemy aircraft. When a crash is reported, an engineer officer of the Repair and Salvage Unit sets off on his compass bearing to locate the aircraft. On arrival, he decides whether or not the wreck can be repaired on the spot. If the work is such that the aircraft need not be moved he has a repair unit sent out. But if the damage necessitates bringing back the aircraft to base, the "aircraft carrier" lorries are sent out. The wreck is lashed to them and hauled home to the forward post, and thence, with others, to base.

A repair and salvage unit of the R.A.F. moving across the desert.

In War-Time Washington

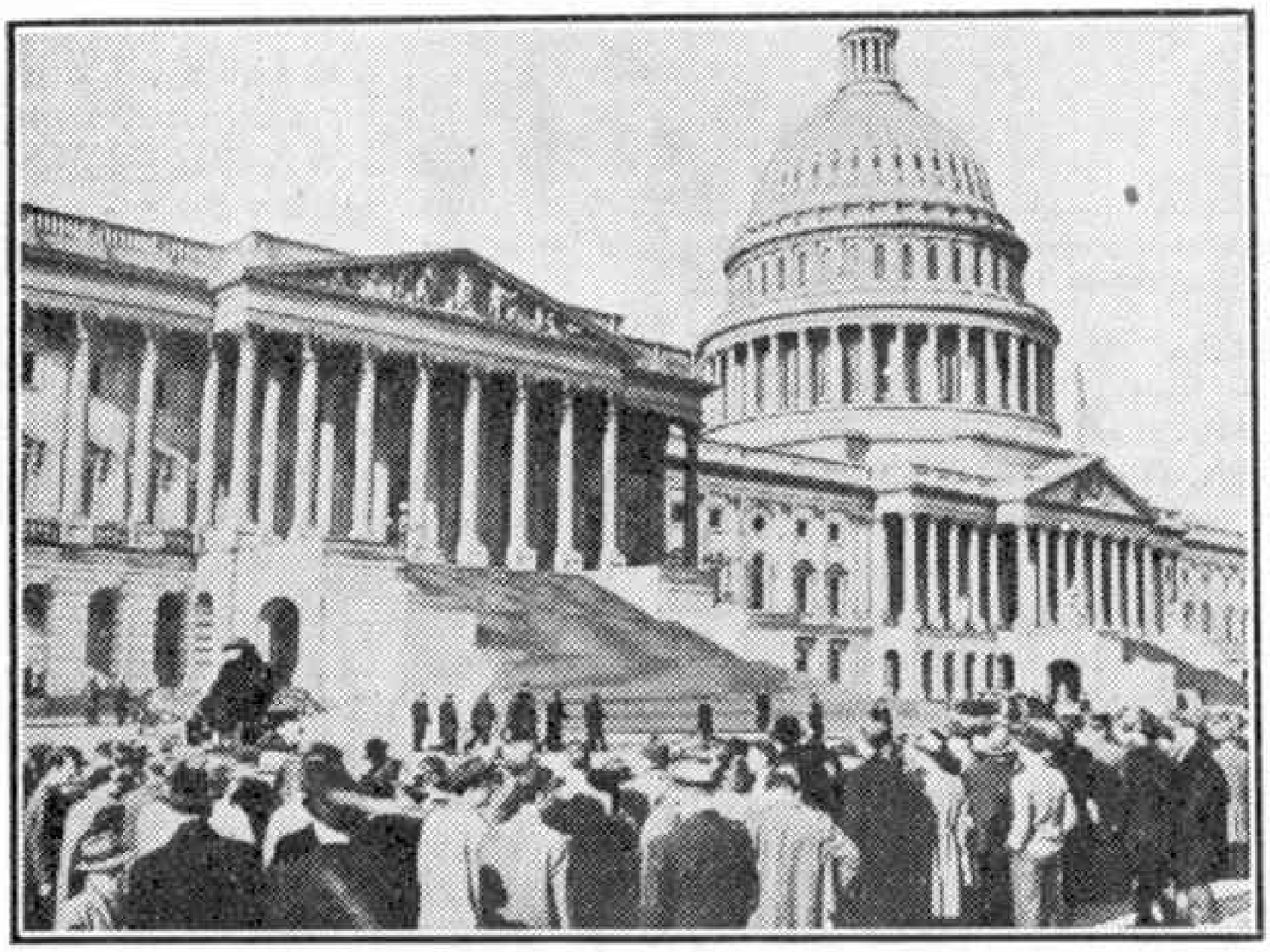
By Harold J. Shepstone, F.R.G.S.

BEFORE the definite entry of the United States into the war, Americans wittily referred to their capital as "the headquarters of the Roosevelt-Churchill axis." Since then Washington has become one of the chief nerve centres in the Allied struggle against the aggressor states; it is from London and Washington that the future strategy and conduct of the war will be dictated.

The normally peaceful, dreamy city beside the Potomac river has become, almost overnight, a hive of tremendous activity. The streets are alive with officers and officials, secretaries and business men, industrialists and union delegates. They have come to the capital to seek advice and obtain instructions from the Office of Production Management, or from the Army or Navy departments. Such words as "priority," "airplanes," "tanks," "guns," and "ships" are heard from a thousand throats wherever you go and whomever you meet.

You cannot get a room in Washington by just asking for it. "House full" notices are displayed in every hotel and every street. Certain hotels have converted their basements into dormitories to accommodate the ever-increasing flow of visitors. Hundreds, unable to find permanent accommodation in the town, live in their own trailers parked across the borders in Virginia and Maryland.

The Government itself is equally hard pressed to find room for its rapidly-growing army of war workers. Old theatres have been taken over and used as offices, the chiefs conferring amid partitions hastily erected in the orchestra, stenographers typing in the boxes, and filing clerks shuffling papers away up in the balcony. The War and Navy departments expand and expand.



Crowds thronged about the Capitol in Washington as Congress gathered for the expected declaration of war against Japan.

The red-brick British Embassy building on Massachusetts Avenue is full to overflowing and a new wing has been added to provide additional space. Even so, the officials dealing with press relations have been crowded out, and have found refuge in a building in the same street. Then there are the offices in the big hotels occupied by the British Purchasing Commission and the British Air Commission.

The Office of Production Management, referred to as the O.P.M., was established in connection with America's rearming programme. It was presided over by Mr. W. S. Knudsen, the Danish emigrant boy who became production chief of General Motors at a salary of £60,000 a year. He threw this up and came to Washington to work for Uncle Sam as a "dollar-a-year man"; this is the phrase applied to the many big business executives who are now serving their government for token salaries. Since Japan entered the conflict, however, Mr. Donald Nelson has been given supreme control of the nation's war-production programme, and he has set up a War Production Board on which Mr. Knudsen occupies one of the principal seats. Donald Nelson is a living proof that America is a "land of opportunity." His father was an

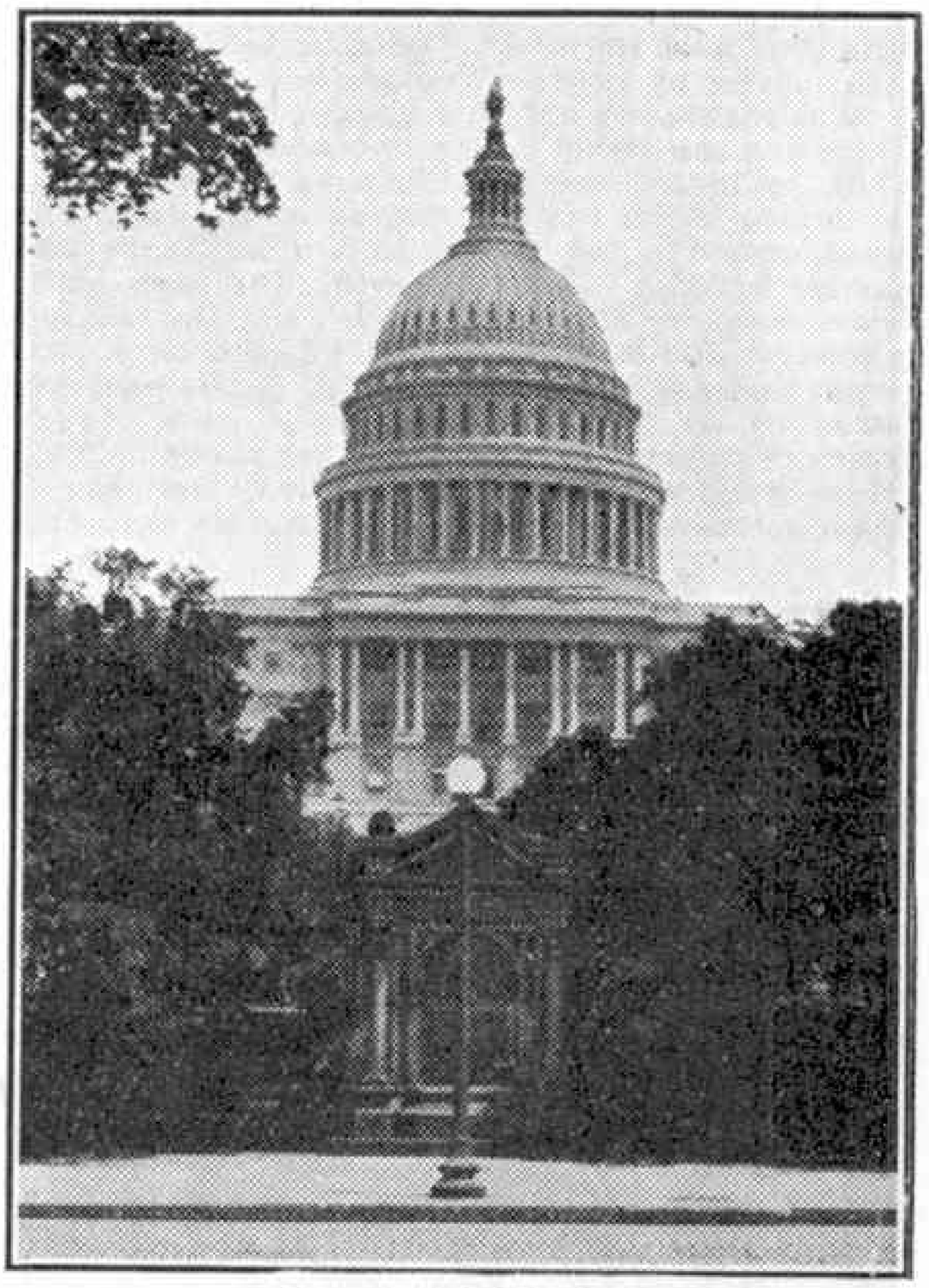
engine driver. Young Donald won a scholarship to the Missouri University and eked out his expenses there by doing odd jobs. Then he entered Sears Roebuck's great mail order store and worked his way up to vice-president.

What is this city, which is destined to play such a vital part in the conduct of the war, like? Let me say at once that it is the most beautiful and alluring city I have ever visited. Then I doubt if there is any city that has witnessed such extensive building activity during the past 25 years as Washington. To-day it is more than half as large again as it was in 1918. Nine months ago it had a population of 500,000; to-day it is well over 700,000, and is expected to reach the million mark within the next twelve months.

Since the first World War of 1914-18 Washington has been virtually rebuilt. Old buildings have been cleared away and upon their sites handsome and palatial structures have arisen. The entire south side of Pennsylvania Avenue, and the Mall, have been lined with truly monumental structures. Here are a dozen or more colossal edifices any one of which is worthy of an article by itself. Take the new Commerce Building as an example. Built at a cost of £3,500,000, it covers some eight acres of ground and stands upon eight miles of concrete piling. The ground here is marshy and heavy buildings have to be carried upon piles reaching down to the rock, 150 ft. below the ground level in some places. The 36 elevators in this single building can carry 800 passengers at the same time, and visitors get lost in its five miles of corridors.

In the new Department of Agriculture building there is enough floor space to cover a 42-acre farm. It is a very busy centre, co-operating with the Government in its attempt to increase the farming output of the country in order to feed its Allies in the war. In the cafeterias of these Government buildings, invariably situated on the top floor, as many as 3,500 to 4,000 meals are served every day. Their mails are carried by underground tunnels running beneath the streets to the Post Office.

An interesting feature of the new Treasury building is its gigantic two-storey vault built of concrete and steel, ingeniously safeguarded against attack by mob, master criminal, or even high-explosive bombs from the air. An ambitious burglar undertaking to tunnel in from below would have to pass through the 9½ ft. of concrete and steel, and the slightest tap of pick, drill, or hammer would betray itself to sensitive



The Capitol, Washington.

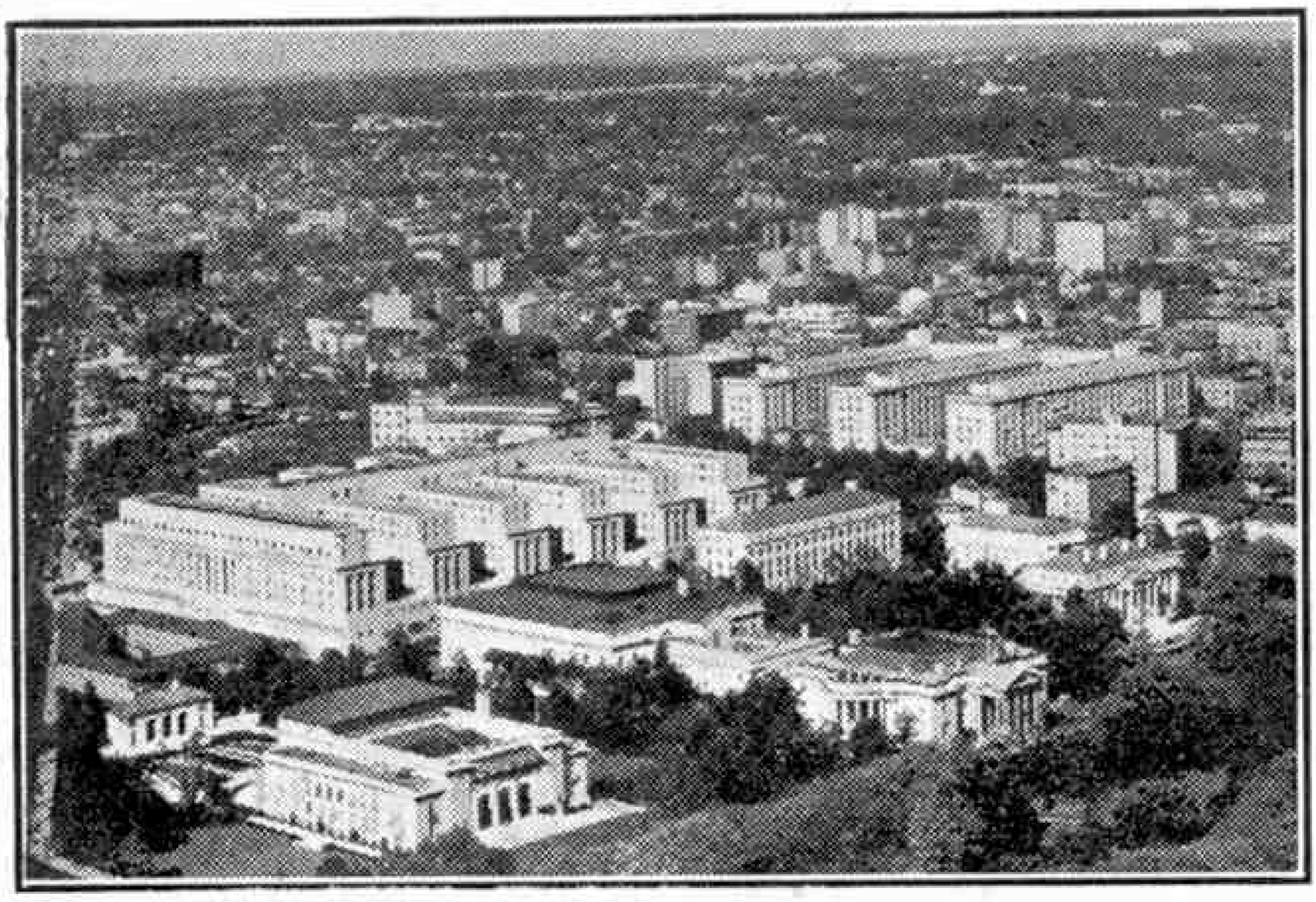
electric "ears," instantly bringing armed guards to the spot. Poison gas also plays a part in the defence scheme. Anyone attacking the vault's doors with an acetylene torch would strike a stratum of chemicals and release gas so powerful that it would penetrate a mask.

But I set out to describe Washington. It was founded a century-and-a-half ago and can claim to be the youngest of the world's chief capitals. The 60 square miles of area upon which it stands consisted of virgin forests and the tobacco fields of English planters. For many years after its founding it was little more than a great sprawling village; to-day it is a city of spacious avenues lined with trees, parks and driveways, stately and handsome buildings and unique monuments.

The city was planned by Major Pierre L'Enfant, a French engineer, and if the truth must be told his idea how a city should be laid out has not found favour with the hustling New Yorker and the busy Chicagoan. Though its streets run straight they are apt to get muddled in its many circles. American cities are built on the rectangular gridiron plan, all the streets running in straight lines like a chessboard. L'Enfant avoided the rigid gridiron pattern by a fine arrangement of radial avenues with circles of intersection.

Thus the ground plan of the city may be likened to a number of wheels whose spokes represent the streets and their hubs the circles, the latter being linked with one another by spacious avenues.

Washington has only one railway station, but from there you can travel in any direction you wish—east, west, north or south. All the lines come to a single terminus, Union Station, said to be the largest and most ornate in the world. It is a handsome white marble building 760 ft. in length. The main waiting room measures 220 ft. by 130 ft., and the passenger concourse, 700 ft. in length, is the largest room in the world under one roof. An army of 50,000 men could stand on its floor. The Americans have a happy knack of placing inscriptions on their public buildings. There are several on Union Station, and many of them are very appropriate, such as: "He that would bring home the wealth of the Indies must carry the wealth of the Indies with him; so it is with travelling—a man must carry knowledge with him if he would bring home knowledge."



Looking over Washington. The Government Department of the Interior as seen from the Washington Monument.

Emerging from the station it is but a short stroll across the park to Capitol Hill, an eminence standing a hundred feet above the river, to the Capitol, the American Houses of Parliament, dominating the entire city. It is a beautiful building and of magnificent proportions, 750 ft. in length, with a width of 350 ft., and covering an area of 3½ acres. The great dome over the central portion is surmounted by a bronze statue of Liberty, towering 307 ft. above the esplanade. The beautiful statuary and paintings scattered throughout its interior are all reminiscent of some of the most stirring events of American history.

The chief centre of interest is the debating chambers, the House of Representatives and the Senate (corresponding respectively to our House of Commons and House of Lords), which together constitute the Congress. The former is composed of about 400 members, and the latter 96, two for each State. The members of both Houses are paid. In the House of Representatives, where Mr. Churchill addressed the members of both chambers, the seats are arranged around the Speaker's desk in concentric semi-circles. Every seat has a silver plate with the owner's name engraved upon it, hence there is no confusion as in our own House of Commons when a full-dress debate takes place. Instead of the small space allowed for visitors to St. Stephen's, there are galleries open to the public right round the whole building.

Close by is the Library of Congress, a beautiful white marble building with a graceful gilded dome, covering 3¾ acres of ground. Above the main entrance one notes this inscription: "Reading maketh a full man: Conference a ready man: And writing an exact man." The main hall and stairway is a vision of splendour with its piers and arches, its coloured marble columns and elaborate frescoes and sculptures.

To the right of the Library is the recently-completed Supreme Court building, a great gleaming white marble temple. Everything about it is on a majestic and lavish scale. On each side of the steps leading to the entrance are two blocks of marble, each weighing 45 tons, the heaviest pieces of stone ever brought to Washington. The entrance is faced with eight Corinthian columns each 50 ft. high. The pediment above them displays interesting sculptures in which the features of historic or living persons are recognised. Below them appear the words: "Equal Justice under Law." The entrance portals consist of two sculptured bronze doors weighing 1½ tons. They portray scenes showing the progress of human justice from ancient Greece to the present day.

Two miles from the Capitol, down the stately Pennsylvania Avenue, is the White House, the executive mansion and home of the President. It is an attractive, dignified two-storey residence of the colonial type standing in a park of 80 acres. It received its name when painted white to obliterate smoke stains caused during the war of 1812.

Beyond the White House grounds is the Washington Monument, and that marvel of artistic conception, the Lincoln Memorial. The Washington Monument is an obelisk 555 ft. high. For many years it held the record as the highest masonry structure in the world. One can ascend the monument by an elevator, free of charge, or by a climb of 900 steps. From the gallery magnificent views of the city may be had.

The Lincoln Memorial is in the form of a Greek temple of pure white marble, a really fitting memorial to a great statesman and leader. Fronting the monument, which is reached by a series of broad steps, is a great reflecting pool. Passing through the Ionic fluted columns into the central hall one is faced with a gigantic marble statue of Abraham Lincoln who is shown seated. The statue weighs 150 tons without its pedestal. On the wall over Lincoln's head these words appear: "In this temple, as in the hearts of the people for whom he saved the Union, the memory of Abraham Lincoln is enshrined for ever."

Just beyond the Lincoln Memorial is the Arlington Bridge spanning the wide Potomac, opened in 1932. It provides ready access to America's national cemetery where her heroes are buried, and here is the tomb of her Unknown Warrior. A somewhat curious monument here is one of the fighting tops of the ill-fated battleship "*Maine*," which was sunk in Havana harbour in 1898, and led to the American war with Spain. It surmounts a granite pedestal over the graves of the victims of the disaster. The Americans placed the ashes of our late Ambassador to Washington, Lord Lothian, in a vault beneath this strange monument.

Sixteen miles away, easily reached by electric tram, is Mount Vernon, the home of George Washington. The mansion and also much of its furniture is exactly as Washington left it. You can see the quarters where the slaves who worked on his plantation were housed, and in Christ Church, Georgetown, now virtually a suburb of Washington, there is still shown Washington's family pew.

Engineering News

Invisible Heat Rays at Work in Industry

Invisible infra-red radiation has been pressed into service in the United States to speed up the manufacture of large electric transformers, the production of which is vital to the expansion of power facilities for the armaments drive now in progress. This has been done in the works of the Westinghouse Electric and Manufacturing Company, East Pittsburgh. There the use of batteries of infra-red lamps has reduced the drying time for the paint on parts of large transformers from the 70 hrs. required for air drying to 50 min. For the present the new lamps are being used only for drying paint on the cooling radiators of transformers, but the experiment has proved so successful that the lamps undoubtedly will find additional applications.

The infra-red lamps used are 250-watt units combining both generator and reflector in a single hermetically-sealed lamp. They produce a narrow, concentrated beam of radiant heat energy, with less than five per cent. of their total energy emitted as visible light. The principle on which these lamps do their heating and drying job is as old as the Sun itself. The Sun emits invisible infra-red heat rays that travel more than 90 million miles through space, yet produce sufficient warmth on the Earth to make it habitable. Approximately half of the Sun's energy is comprised of such rays by the time it reaches the Earth. The Westinghouse lighting engineers have simply built a lamp that produces these heat rays in great proportion to their light rays. Like ordinary light, infra-red rays travel in straight lines and can be focussed accurately, producing an increase in temperature on striking virtually any substance capable of absorbing them. A battery of 129 lamps is shown at work in the accompanying illustration.

Siren that Gives a Visible Signal

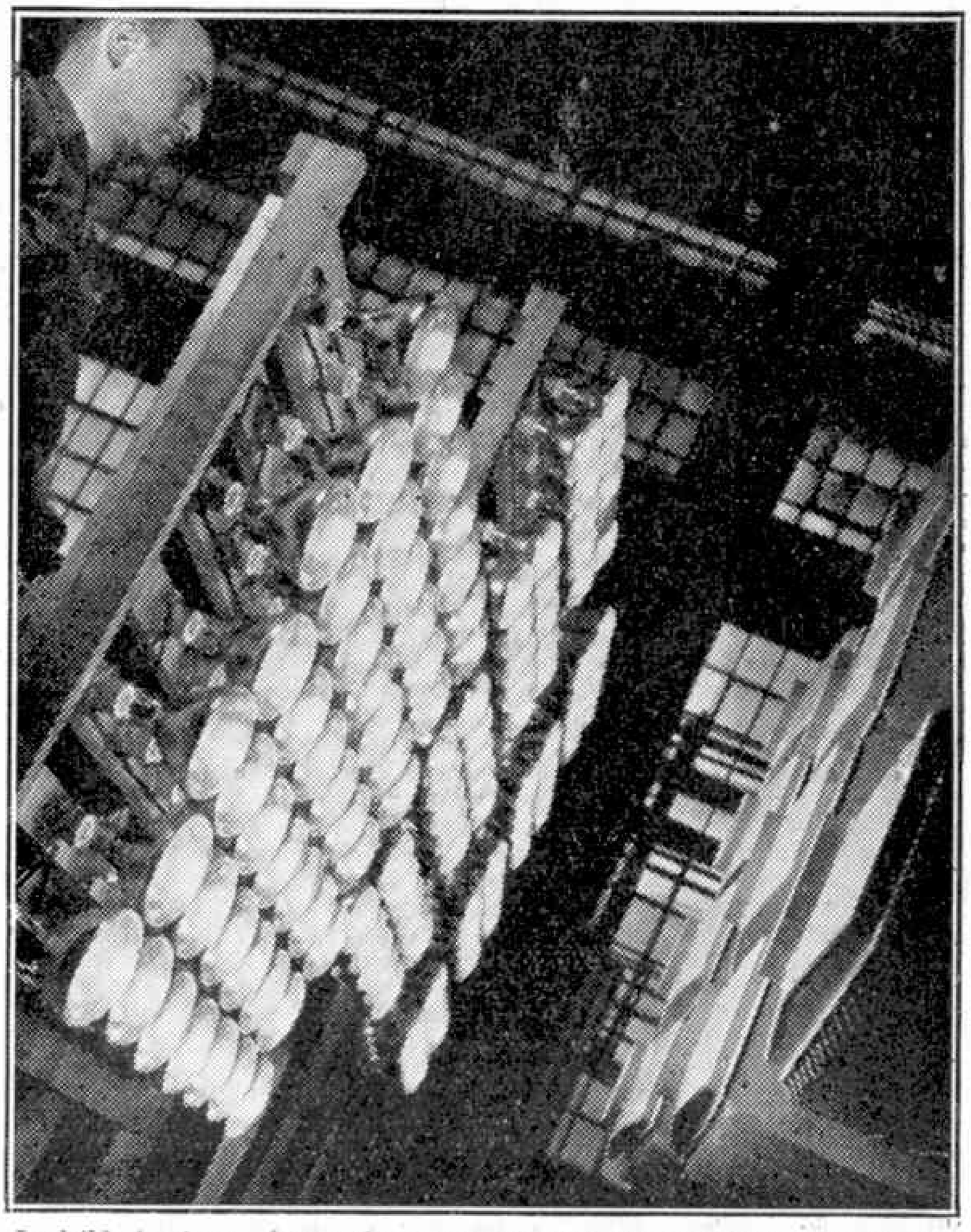
In calm clear weather white puffs can sometimes be seen floating away from the sirens of ships after these have been sounded. They are of course formed by the condensation of the steam emitted while the signal is being given, and soon fade away. An American inventor has devised a fitting for the compressed air siren that actually produces a very dense white column that remains visible for a long time after the blast has died away. Thus the siren writes its own signal in the sky, so to speak, to confirm the one given by its sound. This is a help in crowded waters, where many sirens may be sounding at the same time, as the signals from each vessel can then be identified more easily.

The dense white cloud evolved is about 30 ft. in length, and consists of finely ground aluminium stearate. This is stored in a metal cylinder that can be attached to any compressed air siren, and the clouds are readily visible in any weather except in dense fog. It is not luminous, and therefore is no use at night.

Oil Transporter for Engineering Works

Now that production in engineering workshops is on an intensive scale special attention is being paid to the carriage of oils that are required for machine tools. For this purpose the Alfa-Laval Company Ltd., Brentford, have introduced a series of special oil transporters. Each of these consists of a tank mounted on a wheeled bogie, a central partition dividing the tank into two compartments to contain clean and dirty oils respectively. One of these transporters has a capacity of 40 gallons in each compartment, while a smaller unit with a total capacity of 60 gallons is available. The bogie frame is mounted on three rubber-tyred castors provided with ball bearings.

At one end of the unit are the hand pumps by means of which the compartments are filled and emptied as required. They are provided with three-way cocks, so that oil can be drawn from the tanks or from an external supply, while discharges similarly may be made into the tank for filling up, or to the machine for which the oil is required. The pumps have a capacity of 250-350 gallons per hour, so that only a few minutes are required to effect a complete change of oil for this unit.



Invisible heat rays focussed on transformer parts to speed up the drying of the paint. The time required for this process has been reduced from 70 hrs. to 50 min. by the use of infra-red lamps. Photograph by courtesy of the Westinghouse Electric and Manufacturing Co., East Pittsburgh, U.S.A.

A Fine Goods Run to York

On the Footplate of an L.N.E.R. Mogul

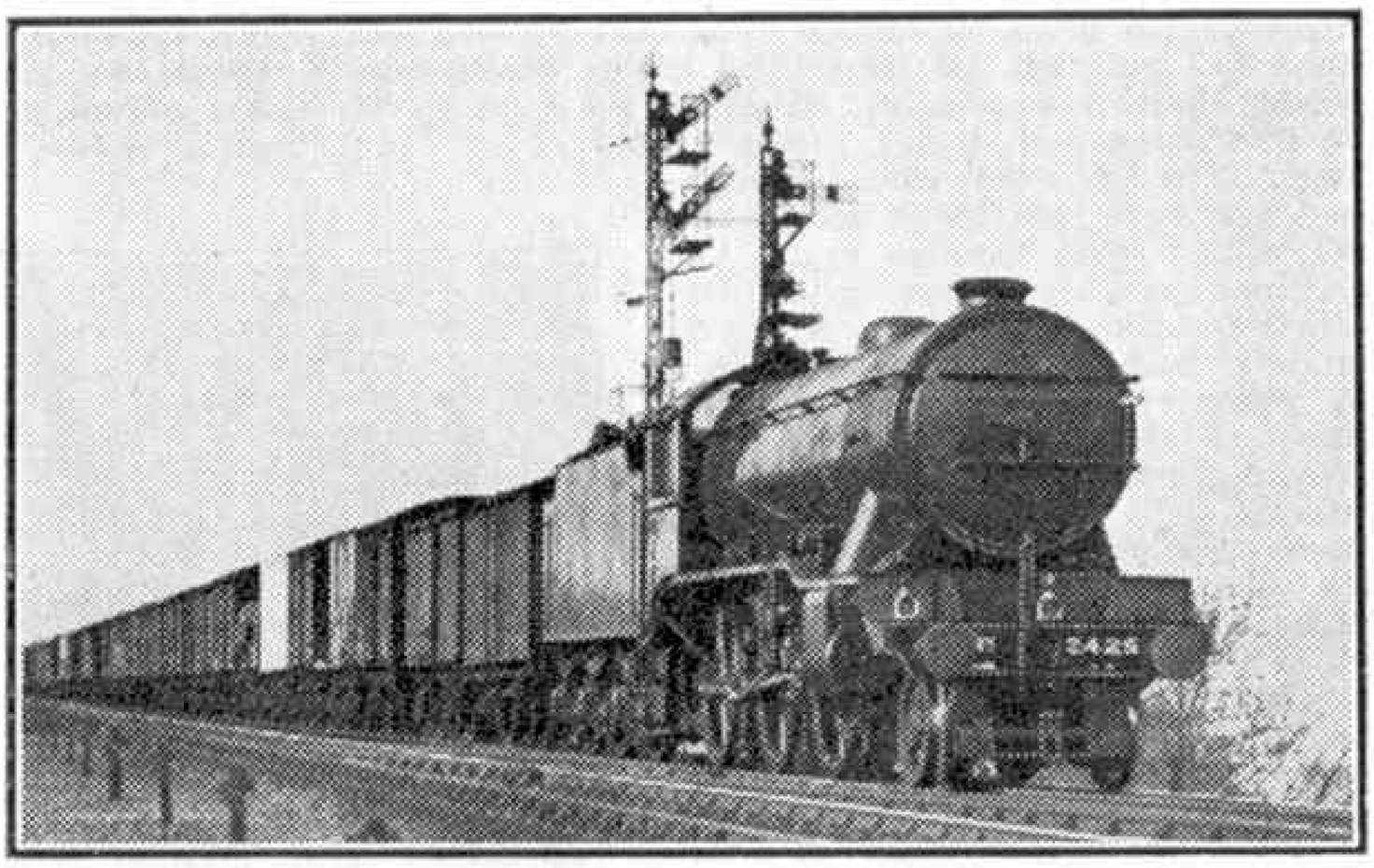
By O. S. Nock, B.Sc., A.M.I.Mech.E.

THE handling of a heavy express goods train is one of the most exacting of engine-driving tasks. These trains have their own appointed paths, and strict timekeeping is, if anything, still more important than with passenger traffic; for a crack express passenger train, if late and running out of turn, is still given priority—in peacetime of course—and there is some chance of time being made up. A goods, however, must give way to an express passenger, and so closely dovetailed are some modern train workings that late running by as little as ten minutes may mean sidetracking. Then the initial delay probably will be increased to half an hour, or more, and there will be little chance of any recovery later. The running of the pre-war 6.37 p.m. express goods from Peterborough to York, L.N.E.R., provides an excellent example of the exactitude needed in the operation of some of the most important passenger and freight trains.

In readiness for a trip on this train I joined Driver Sallins and Fireman Truss on the footplate of a "K3" Mogul, No. 2450, in Westwood Yard, Peterborough. The load was heavy, consisting of 47 vehicles, all four-wheelers, and equal to 610 tons behind the tender. All was ready for the start, but we were waiting for the down "*Silver Jubilee*" to go by, after which we were booked to take the main line, and run non-stop to York. Behind us would be the 5.45 p.m. Newcastle express. Although this train was not booked to pass Peterborough until 7.5 p.m., 28 minutes after our departure time, she is a real flyer, as readers will remember from my description of a footplate journey on the streamlined Pacific "*Sir Nigel Gresley*" in the "*M.M.*" for October 1938. So, with a start of 28 minutes, our "K3" Mogul had got to reach York before the Newcastle express. If there was any doubt about our doing so, "Control," watching our progress, would immediately give instructions for us to be sidetracked in some suitable refuge loop. Actually this very fast goods train is booked to cover the 111.8 miles from Westwood to York in 149 minutes; this gives a clearance margin of 10 minutes in front of the express, and requires an average speed of 45 m.p.h.

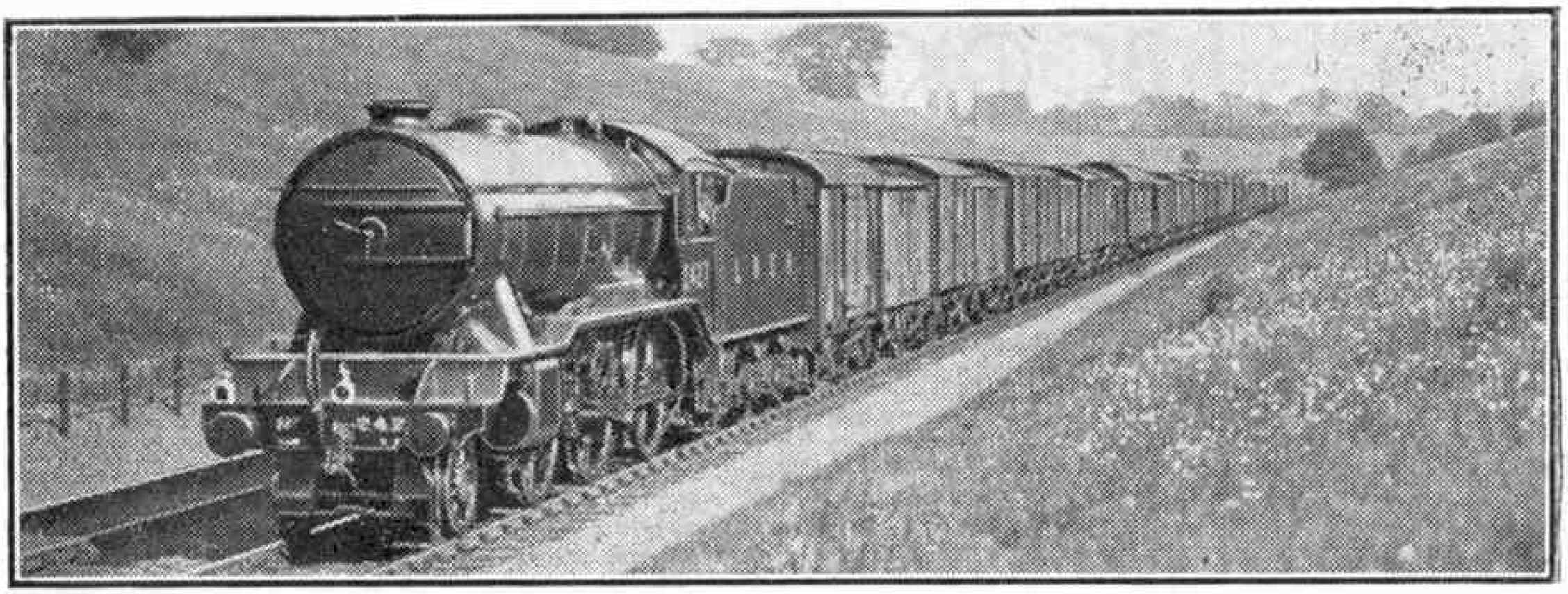
Though naturally ranking second to the "Green Arrow" among L.N.E.R. mixed traffic engines, the "K3s" are very powerful, and actually represent a greater concentration of power, in relation to their total weight, than the 2–6–2s; for the "Green Arrows," weighing 93 tons without their tenders, have a tractive effort of 33,730 lb., whereas the 72½-ton "K3s" have a tractive effort of no less than 30,000 lb. The cab layout is generally similar to that of the "Pacifics," and despite the 6 ft. diameter boiler there is an excellent look-out ahead. As it was September most of the trip was made in daylight, on a calm fine evening when the countryside as well as the locomotive work could be thoroughly enjoyed. Dead on time the "*Silver Jubilee*" came through; as she passed, the engine, "*Silver Link*," was getting into her stride again after the 20 m.p.h. slack through Peterborough. A moment later our signals were pulled off, and soon our huge train of 47 vans was winding snake-like over the crossover on to the main line.

Our driver started No. 2450 quite gently. There was no attempt at rapid acceleration; the valves were quickly linked up, and the engine was allowed to find her own pace. Steadily we gathered speed, and on the level road past Werrington water troughs we reached 50 m.p.h. This was good work, but a heavier task lay ahead. The long rise to Stoke summit is truly a testing ground for any locomotive and with the heavy Scotch expresses of 450 to 550 tons the "Pacifics" usually fall to about 45 m.p.h. The rise begins near Tallington, and continues with scarcely a break for 15 miles. With this heavy goods train Sallins had No. 2450 going well at 52 m.p.h. when we began the climb, and at once he began to open out. Here indeed was engine-driving developed to a fine art. A fractional turn of the wheel, making an increase of only 2 per cent. in the cut-off; changes in the controls made with careful regard to the steepening gradients; Fireman Truss placing each shovelful of coal at a definite spot on the grate—their work was a delight to watch.



A "K3" Mogul, No. 2425, hauling a heavy L.N.E.R. express goods train. Photograph by courtesy of the L.N.E.R.

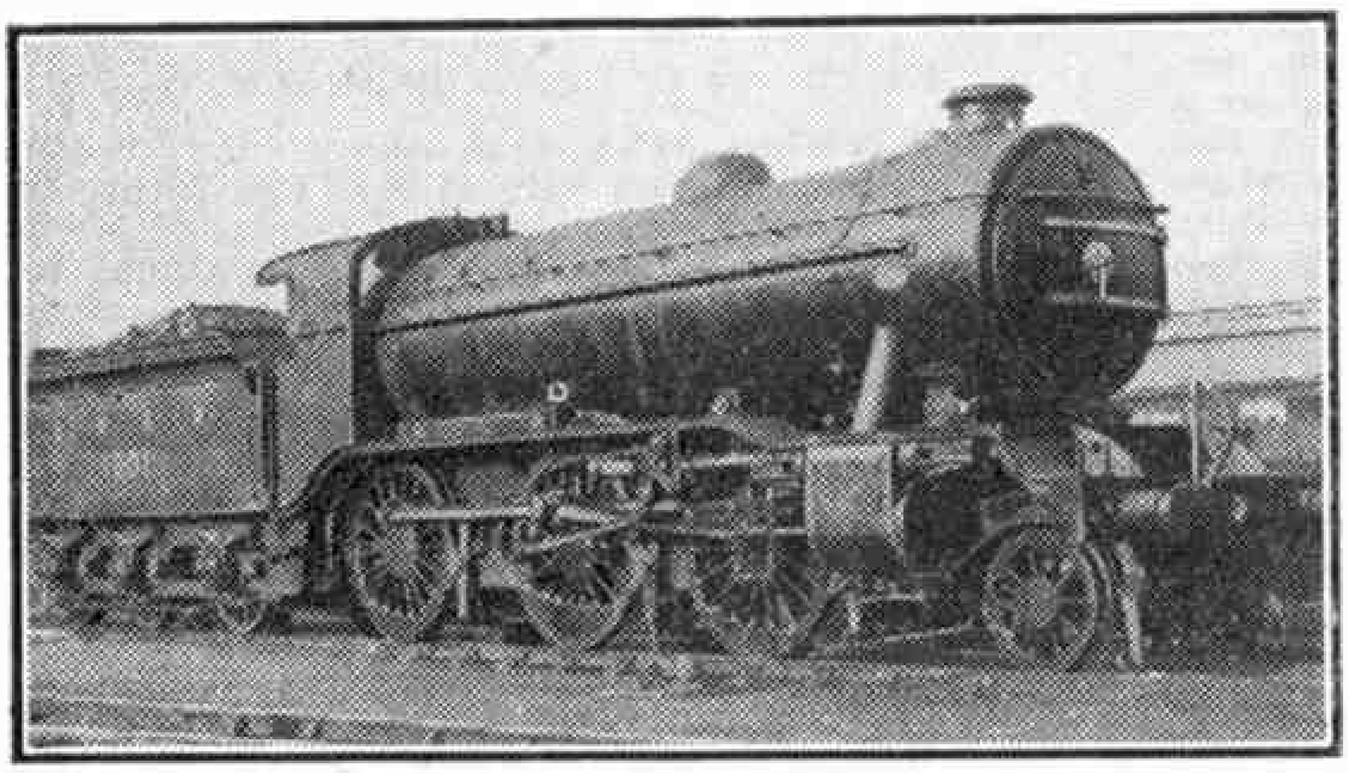
By the time we had entered upon the most trying part of the bank, the 6 miles of continuous 1 in 200 past Little Bytham, No. 2450 was pulling magnificently and sustaining 41 m.p.h. To show how good this was I may mention that with the Pacific engine "*Royal Lancer*," and a Scotch express of 520 tons, we did 46 m.p.h. up this incline, so that 41 m.p.h. with a 610-ton goods train was fine climbing. Far from being thrashed, No. 2450 was working on no more than 28 per cent. cut-off, with the regulator full open; in full forward gear on the "K3s" steam is cut off after the pistons have travelled 65 per cent. of their stroke, so that with only 28 per cent. she was a long way from being driven "all-out." So we passed Stoke summit, 23 miles from the start, in 34¼ minutes, and began the descent to the Trent valley. The valves were linked right up, and we began to accelerate almost as rapidly as the passenger trains do. Sallins eased still further by closing the regulator a little, but there was no holding the engine, and we rattled our 47 vans through Grantham at a merry 65 m.p.h.; 40 minutes from Peterborough—dead on time.



The 3.35 p.m. Scotch goods at full speed, hauled by No. 2427 of the same class as No. 2450 on which the author rode. Photograph by E. R. Wethersett.

Down the continuation of the incline, to Newark, we could easily have kept up this speed, or gone even faster, but there was no need. The schedule is not so exacting here, and by further closing of the regulator Sallins allowed the engine to drift down to 48 m.p.h. Even so we passed Newark a minute early. Respite was short lived, however, and from now onward it was a case of "going for it," hard, all the way to York. As we passed Newark cut-off was increased from 15 to 20 per cent., and regulator opened wide. No. 2450 accelerated splendidly to 56 m.p.h. on the level, and was taking the rise to Markham in fine style, when, most annoyingly, adverse signals were sighted and we had to slow down to 15 m.p.h. before they cleared. A few minutes later we were coasting down the Gamston bank towards Retford; again signals were "on." Our driver thereupon made some very pungent remarks about passenger trains that must get in the way! We crawled from signal to signal right through Retford station and yard, and it seemed that sooner or later we should certainly be stopped; but at last we got the road, and Sallins opened up in real earnest.

But we were now nearly five minutes late, and the trouble was that any further delay would probably



One of the "K3s" as built, before grouping, by the G.N.R., and carrying its original number. This engine is No. 4001. Photograph by W. J. Reynolds.

mean our being sidetracked at Selby to let the 5.45 p.m. express from King's Cross go ahead. A fine acceleration soon brought us up to normal speed, however, and in the dusk, nearing Doncaster, we reached 59½ m.p.h. Through the yards we sped; goods trains were everywhere, and then, suddenly, out of the gloom, like something shot from a gun, came the up "*Coronation*"; going at least 75 m.p.h. she was past in a flash of blue and lighted windows. All the Doncaster signals were clear for us, and we roared through the station in great style, with No. 2450 working on her normal 20 per cent. We were still 4½ minutes late, having covered the 78.9 miles from Peterborough in 108½ minutes, but with a level road now ahead engine and crew settled down to a spell of really hard running.

It was nearly dark now, and there was little to be seen outside, but in the cab things were as fascinating as ever, perhaps even more so. Gauge dials showed up in the light of the fire; across the cab I could see clearly the pointer on the cut-off scale, and all the time the fireman was busy adjusting the injectors, spraying the coal on the tender, in addition to stoking. Running at 52 to 54 m.p.h. on this fine level road we were burning about a hundredweight of coal every three minutes. The engine was riding hard, but quite steadily. The running on this stretch shows very clearly how much "heavier" four-wheeled goods rolling stock pulls, in comparison with bogie passenger stock. Full regulator and 20 per cent. cut-off is the kind of adjustment one sees for really high speed working, and I calculate that with an equal dead weight of passenger coaches we should have been running at over 60 m.p.h. along this stretch. With our 47 four-wheelers we averaged 51 m.p.h. for 16 miles; and now we were nearing Selby.

Anxiously I peered ahead for a first sight of the signals; but Sallins was already shouting across to me "We're alright; we're right-away to York." A second or so later I too saw that the signals were all-clear; we were not going into the loop. Speed was reduced to 30 m.p.h. in readiness for the crossing of the swing bridge and negotiation of the curve beyond, and reading my watch as we ran through the station I saw that a minute of lost time had been made up—97.3 miles from Peterborough in 130½ minutes.

With No. 2450 barking lustily now, as we gathered speed for the last stage, I noticed that Sallins fixed his cut-off at 22 per cent.; the line is rising ever so slightly here, and with the precision that had marked his driving throughout, the engine was given just a little more steam than usual on the level. We worked steadily up to 51 m.p.h.; for the second time we crossed the Ouse, by Naburn bridge, and so round the curve at Chaloner Whin and into the final straight. More and more signal lights loomed ahead; we coasted in, with steam off and the engine clanking merrily, and came to rest at Severus Junction, where a "Pacific" was waiting to take over for the run to Newcastle.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 6d. for postage.

"ENGINES OF WAR"

(A. and C. Black. 7/6)

We reviewed the first edition of this splendid book in our August 1941 issue. Our mechanised Army has developed so quickly in the interval that in this new edition the chapter on the Royal Armoured Corps has had to be entirely re-written, while other revisions have been made and new photographs included. The illustrations are a special feature of the book. There are 75 reproductions of splendid photographs, all full of action and illustrating how every section of our modern Army works. A royalty on every copy of the book sold is given to the Soldiers', Sailors' and Airmen's Families Association.

Every section of the Army is dealt with in turn, beginning with an account of the Royal Armoured Corps. This deals with "Churchills," "Valentines," "Waltzing Matildas" and other tanks, illustrating their value by stirring stories of actual warfare. Then we turn to the Royal Artillery and to Anti-Aircraft Defence, after which we see how the Royal Engineers build bridges, locate minefields, dispose of unexploded bombs and generally ease the way of the fighting forces. This brings us to the infantry, still the backbone of the Army, who are now capable of moving at high speed in Bren carriers and lorries. Finally come the stories of the Royal Corps of Signals and other Corps that keep the Army supplied and in good form, and of the growth of technical training in the Army that mechanisation has made necessary.

"THREE AGAINST THE SEA"

By Robb White (John Lane. 7/6 net)

The author has made this one of the most real and interesting adventure stories that could be wished for. The scene is an island in the West Indies, where a planter is trying to grow tung oil trees. With him are his son and daughter, Linc and Sandy, whose greatest desire in life is to have a yacht in which they can sail the tropical seas surrounding their island. Then adventure comes. They see a boat wrecked deliberately, and the rough-looking crew try to bribe them to say nothing about it. They make no promises and later, when they find Jake Bean almost dead farther down the beach, they realise the danger they are in. When Jake recovers he tells them how he has refused to fall in with the plan to wreck the ship for salvage, and then begins a double fight, against the sea and storms on the one hand and against the rascally crew on the other, for possession of Jake's money lost in the wreck. The story is full of excitement that rises to a climax as a hurricane breaks over the scene, but the money is recovered and the rascals are beaten.

"PASSED AS CENSORED"

By Macdonald Hastings (Harrap. 8/6)

This very interesting volume tells the wartime experiences of the author, a feature writer of a well-known illustrated weekly. With Mr. Hastings we see every phase of the war in which we are now engaged. We watch Army manœuvres, fly with pilots of fighters, bombers and flying boats, visit munition factories and sail with the men of the Navy and of the Merchant Service. The author seems to have gone everywhere his book including stories of air raids in this country, of submarines and minesweepers at sea, and logging in Canada. He tells us too about the shooting of pigeons that steal our crops, of wartime things that have made him laugh, and of a Cockney boy, evacuated to a country village who dreams only of London's buses.

Everything in the book Mr. Hastings has seen for himself, and in one of his stories the realism is startling, for it describes a blackout motor car collision in which his leg was broken. The volume is indeed a brilliant picture of the nation at war, and is illustrated by 31 excellent full-page plates.

Owing to wartime difficulties, it is impossible to guarantee prompt delivery of books ordered as described at the head of this page, but every effort will be made to ensure speedy despatch.

"SWIFT FLIES THE FALCON"

By Esther Melbourne Knox

(Frederick Muller. 6/- net)

Here is a story with all the romance and chivalry of the Crusades in it. Its hero is a boy who sets out with his sister to find their father, who had gone to the Holy Land in order to help in wresting it from its infidel conquerors, and we follow them across England to London and then on the way to the East through Germany, Hungary and Constantinople.

Many and varied were the adventures of the party on their long journey, and these culminate in their appearance at the siege of Antioch, in the capture of which they give unexpected help to the Crusaders. The boy does not find his father, who had fallen in battle, but he does find himself, for he is knighted and assumes the responsibilities of his father's earldom. There are 22 illustrations.

"I MADE IT MYSELF"

By Arthur C. Horth (Batsford. 6/-)

Mr. Horth is already known to readers of the "*M.M.*" as the author, with his wife, of the "101 Things To Make" series, many of which have been reviewed in the "*M.M.*" He has now broken further ground by describing how to make a variety of models, all of which are within the range of an ordinary boy. They include working toys of different kinds, miniature houses and furniture, floor trains and signals, a kaleidoscope, a scooter and a cross bow and catapult gun. Readers who enjoy making things for themselves will be sure to find in the book models that attract them, and all will find useful guidance in Mr. Horth's methods.

The book is fully illustrated by diagrams and photographs.

"HOUSE IN DISORDER"

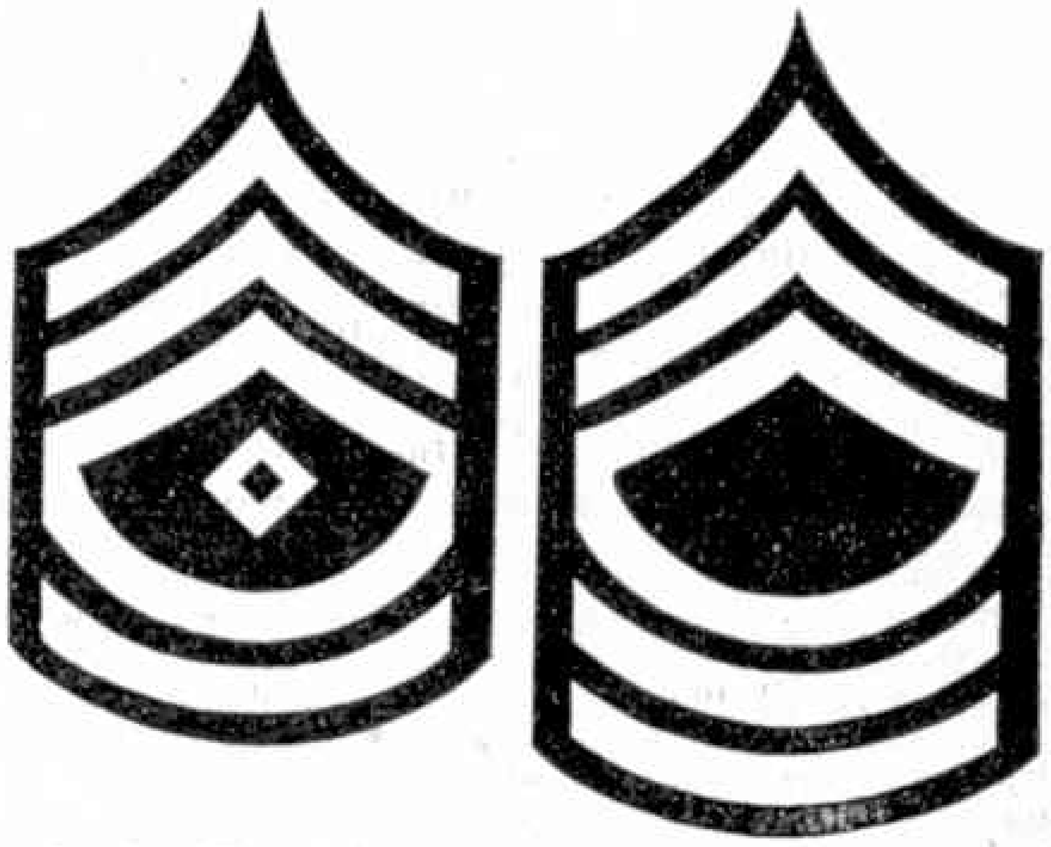
By L. A. G. Strong (Lutterworth Press. 7/6)

Mr. Strong's stories are always original and delightful, and this is no exception. It deals with the adventures of three brothers who fall into the hands of a plausible swindler, and tells how they escape from him and help to bring his schemes to grief. The boys themselves and their chief ally, a girl from a neighbouring farm, behave throughout just like real boys and girls and are very likeable, and there is plenty of fun and excitement in which the reader will share.

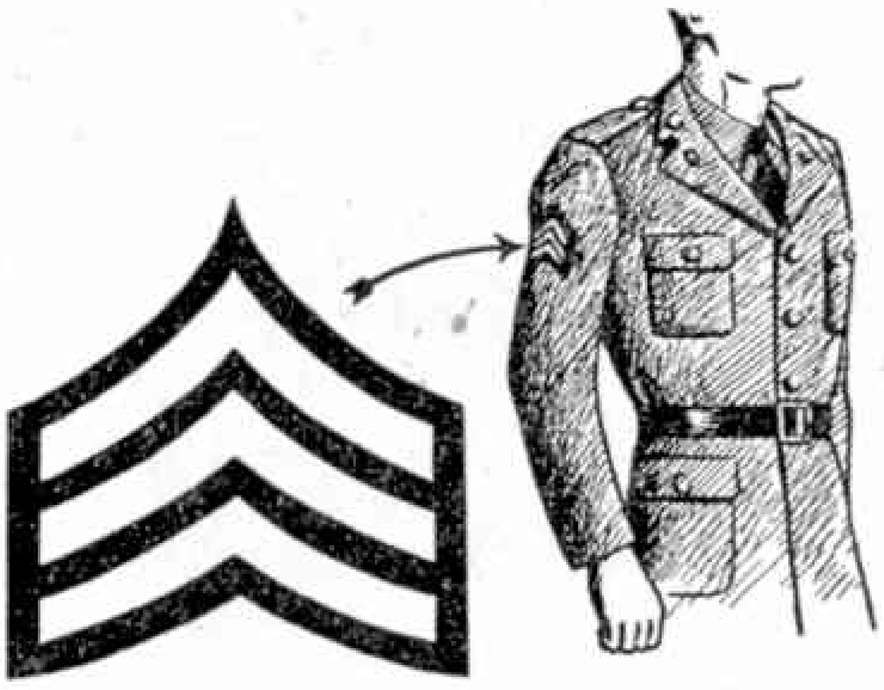
Stripes and Bars in the U.S. Army

One Stripe—This man has climbed the first step up the long ladder and is now a "private first class," or "P.F.C."

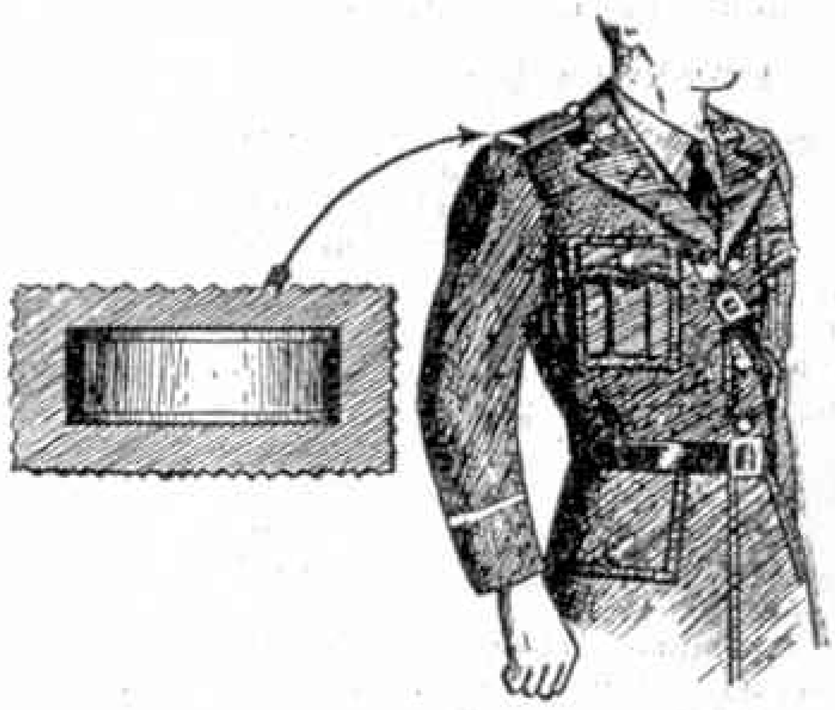
Two Stripes—Denote a corporal.



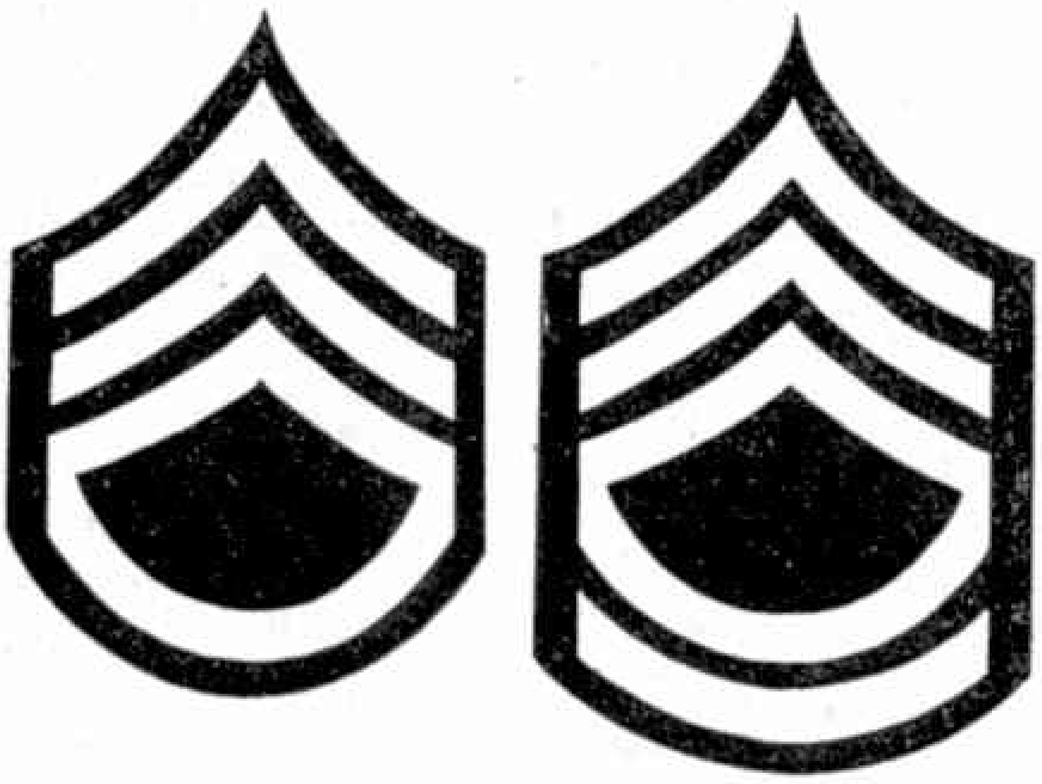
Left—First sergeant. **Right**—Master sergeant, wise in the ways of war and usually a veteran soldier.



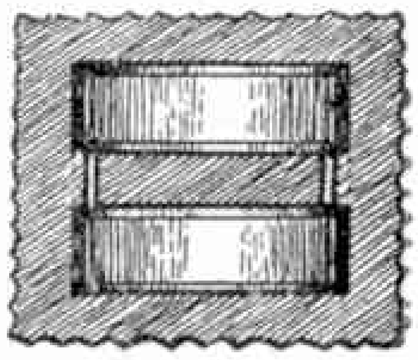
Three Stripes—Indicate a sergeant.



The first commissioned officer is the lieutenant, who wears one bar on his shoulder. When the bar has turned from gold to silver he has graduated from second lieutenant to first.



Left—Staff sergeant. **Right**—Technical sergeant. Each is a specialist in his line, the technical sergeant drawing the larger pay.



Two silver bars denote a captain.

A gold leaf indicates a major and a silver oak leaf a lieutenant colonel. A silver eagle is worn by a colonel.

The silver star denotes a general. A single star indicates a brigadier general; two stars a major general; three stars a lieutenant general, and four stars a full general.

For our illustrations and notes we are indebted to the courtesy of the editor of the *"Boeing News,"* the staff journal of the Boeing Aircraft Company, U.S.A.

Railway News

The G.W.R. "Bulldog" Class

The illustration on this page shows one of the G.W.R. "Bulldog" semi-express engines built at Swindon in 1899. This is No. 3291, originally numbered 3329, and it is one of the last batch turned out with Belpaire fireboxes. The engine is shown as now running on the Cambrian section, with superheater boiler, and is carrying one of the train number boards that were used in peacetime to facilitate recognition of trains at stations and junctions on busy days.

These locomotives were developments of the "Duke" or "Pendennis Castle" 4–4–0 class, having driving wheels 5 ft. 7½ in., diameter. Originally the name-plates were placed horizontally on the front end of the boiler, then on the side of the smoke-box, and afterwards in the neater semi-circular form over the splasher.

There are not many of these good old engines left now, though there is a new "3200" type of light 4–4–0 for country and branch working where axle loading is strictly limited.

Locomotive News

Among engines recently put into service we have noted oil burning 2–8–0s modelled on the Stanier L.M.S. design, numbered 496–520 and probably destined for overseas. On the L.N.E.R. the "V2" 3-cyl. 2–6–2s are already more numerous than the "Pacifics," and the class is still growing. The continuous series from 4771-4899 has been completed, the latest locomotives of the type noted at work bearing numbers 3641 and 3655-63.

Great Western "Halls" numbered up to 6934 have been seen, also 2–8–0s numbered 3834-41, and 0–6–0Ts Nos. 4606-10. Some 4–6–0 mixed traffic engines have returned to traffic painted black. It is now known all goods engines will be similarly finished. The fifth and sixth examples of the Southern "Merchant Navy" 4–6–2 type came into traffic early this year; No. 21C5, the fifth of the class, has been named "*Canadian Pacific*." The first of a new Bulleid 0–6–0 class has been turned out. This will be illustrated in our next issue.

The L.M.S. "Coronation" class 4–6–2 that was exhibited at the New York World's Fair has been returned safely to this country, having been stored in the United States for some time after the outbreak of war.

A Midland Compound's Fine Run

This year some of the L.M.S. Euston-Birmingham fast trains have again been worked by 4–4–0 Standard Compounds, operating now on wartime schedules. This is a reminder of the achievements of the engines on this service before modern 3-cyl. 4–6–0s were introduced. The distance between the two cities is 113 miles and the time allowed was two hours. These runs usually included one stop, though at least one train in each direction at that time called at two stations without increase of overall time.

Of a number of journeys logged in each direction non-stop between London and Coventry on timings requiring an average of 58 m.p.h., decidedly the fastest was achieved by No. 1053, actually one of the earliest of the Midland Compound type built by the L.M.S. The start from Euston was 2 min. late. There was no banking assistance up the short, sharp rise out of the terminus and signal and permanent way delays cost over 3 min., yet the arrival at Coventry was exactly to time. The load was 275 tons gross behind the tender.

The out-of-course slowings occurred at and just beyond Watford, after which there was steady acceleration to almost 60 m.p.h. up the 1 in 330 to Tring summit. From passing Tring station, at 61½ m.p.h., to mile-post 81¾, where brakes were applied for the service slack through Rugby, 50 miles were covered in 43½ min. at an average of 69 m.p.h. The downhill maximum touched before Leighton Buzzard was 78, followed by speeds between 69 and 75 through Bletchley and Wolverton. Up the short rises to Roade and Welton, minima were respectively 58 and 61½, with a maximum of 71½ before Weedon.

G.W.R. locomotive No. 3291 "Thames," of the rebuilt "Bulldog" class. Photograph by courtesy of T. W. Male.

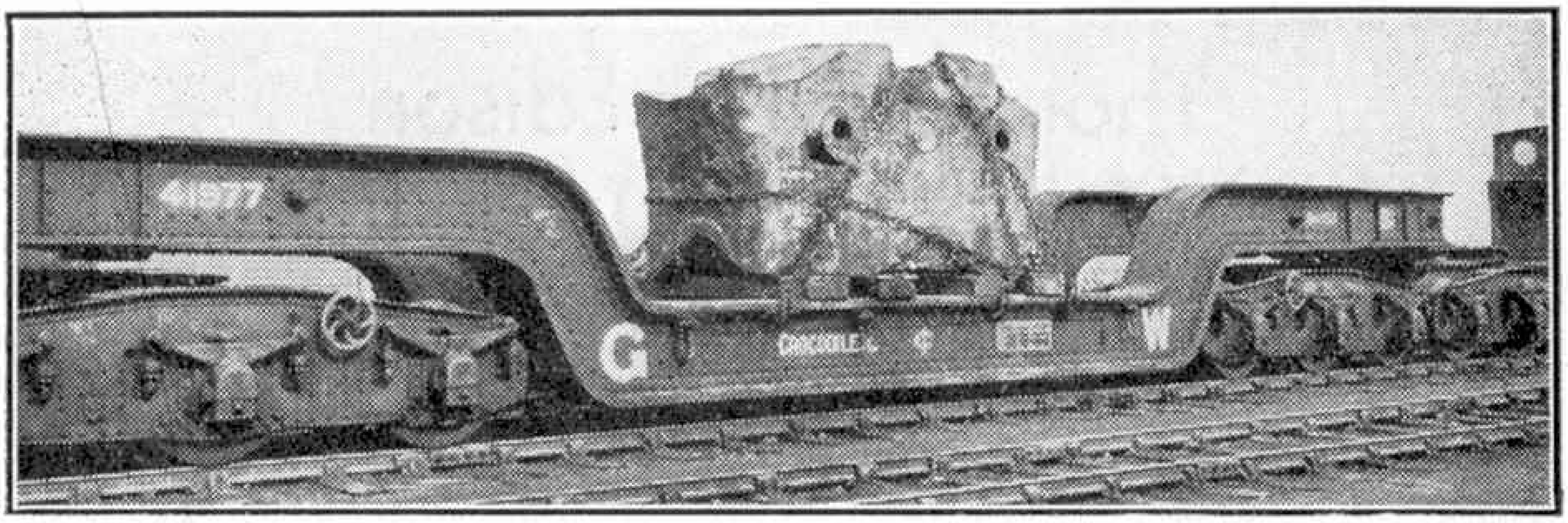
Rugby, 82½ miles, was passed in 83¾ min. actual, or 80 min. net., and the rate of travel worked up to 71 m.p.h. on the nearly level final 11 miles before a stop at Coventry was effected in 95 min. for the 94 miles. Allowing for the delays the net running time was about 91¾ min., representing a start to stop average of 61.5 m.p.h. and proving that in favourable conditions and with this load the 4–4–0 could maintain the fast 92-min. timing that was to be introduced later in connection with the London-Birmingham accelerations. This fine run was recorded by Mr. R. A. H. Weight.

A Locomotive Coincidence

In these days of grouped railways possessing engines numbered in thousands and even tens of thousands, there are fewer opportunities of noting two different companies' locomotives bearing the same number, in close proximity to one another. Recently, however, G.W.R. 6154 of the "6100" class, and L.N.E.R. 6154, former Metropolitan, "M2" type, were seen at Aylesbury at the same time. They are large passenger tanks of the 2–6–2 and 0–6–4 wheel arrangements.

* * * *

The distinctive colours of British locomotives, together with linings, emblems and other decorations, are to be discontinued during the war. All engines are to be painted black as they become due for repair. Only a single bottom board of new and repaired open wagons is to be painted; this will be lead colour.



A remarkable salvage load on the G.W.R. A steam-hammer block weighing 85 tons on a 24-wheeled girder wagon, the G.W.R. code name for which is "Crocodile L-for-Lucy."

85-ton Giant Rides 120-ton Crocodile

A large works near London has just increased the capital's war-scrap collection with a giant steam-hammer block, an 85-ton lump of solid steel 12½ ft. long, 8 ft. broad, 6 ft. thick. It is to be broken to pieces so that it can be melted and reforged into munitions.

The block made its journey northward on a G.W.R. "CROCODILE L-for-Lucy," as the company call their 24-wheeled girder wagon in code. This is built with interchangeable centre sections to suit loads of various shapes. It weighs 82 tons and can carry up to 120 tons. Craning the block was impracticable, so a small army of skilled loaders manhandled it with the aid of portable jacks and baulks of timber. They lifted it from a deep well to ground level, edged it inch by inch along the yard to the track-side, and then raised it on to the crocodile.

A special rail route was plotted for the giant, and it was checked mile by mile to make sure of clearance past every curve, bridge and lineside structure.

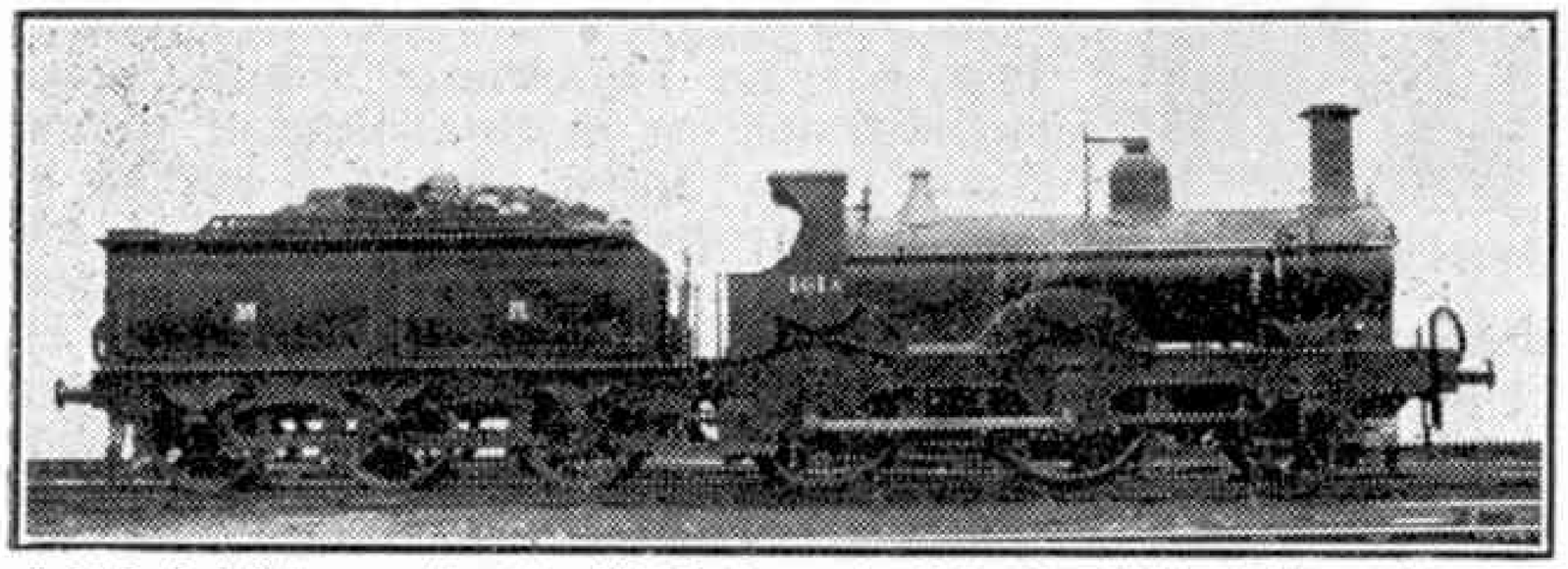
Kirtley Veterans on the L.M.S.

It is remarkable that on the L.M.S., which has made such strides in the replacement of old locomotives by new standard designs, there should remain in service what is probably the oldest tender locomotive still in use in Great Britain. This is No. 20002, which has the distinction of being the oldest engine in regular service on the L.M.S. system. This veteran dates back to 1866, and so this year attains the very respectable age of 76.

No. 20002 was built to the designs of Matthew Kirtley, then Chief Mechanical Engineer of the former Midland Railway, and it says much for his skill as a designer and for the workmanship put into the engine that it is still going strong and playing a useful part in the railways' war effort. It has naturally been rebuilt in the course of its long life; details have been added or altered, but in the essential features of its design it remains the same.

No. 20002 was originally No. 158 of the Midland Railway. It belonged to what was known as the "156" class of 2–4–0 passenger engines, with 16½ in. by 22 in. cylinders and driving wheels of 6 ft. nominal diameter. Later it became No. 158A; then in the extensive renumbering and classification of Midland engines that was undertaken in 1907 it became No. 2, retaining this number on the formation of the L.M.S. Finally under the renumbering scheme of 1934 it became No. 20002. Even in fairly recent times the few survivors of this class have done a great deal of useful and at times speedy work on long cross-country branch lines. Comparatively late in Midland history they still sometimes appeared as pilot engines on main line trains, their outside frames and cranks and generally diminutive appearance being in strong contrast to more modern train engines, such as the Deeley Compounds, that they piloted.

At the moment of writing No. 20002 is working in the Nottingham area on branch line duties. It is not the last of its class however, for there are still two others in service, each a year younger than No. 20002. These are Nos. 20008 and 20012. The latter of these is shown in the lower illustration on this page, on which the very deep and solid outside framing, one of the outstanding features of the class, can be seen. This together with efficient maintenance may have accounted to some extent for their lengthy existence. No. 20008 remains the last of the class in the Birmingham district, and has been observed there attached to an official inspection saloon.



L.M.S. 2-4-0 locomotive No. 20012, formerly M.R. No. 161A. This engine was built in 1867 and is still in active service. No. 20002, a sister engine built in 1866, is probably the oldest locomotive in service in Great Britain.

New Rolling Stock for Newfoundland

The railway system of Newfoundland was merged into a Government controlled line in 1926, with 748 miles of route. The main line is rather circuitous and as most of the areas served are sparsely populated they could not support frequent services. In order to bring the rolling stock up to date in greater quantity than had been practicable, a loan has been granted by the U.S.A.

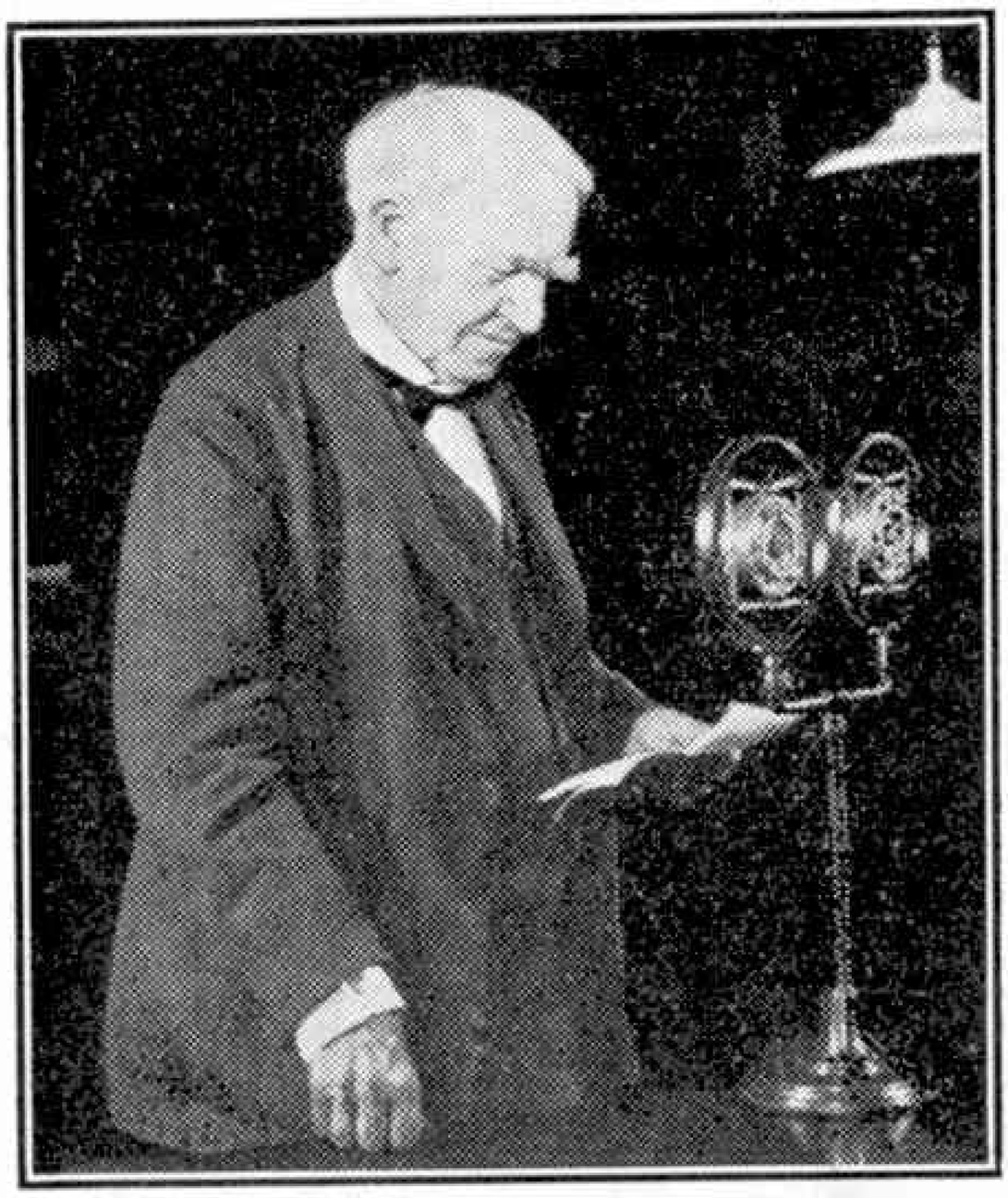
Seven powerful mixed traffic locomotives are now on order from American and Canadian firms, as well as substantial numbers of passenger train vehicles, box cars for freight, snow ploughs and permanent way vehicles. Two fine 2–8–2 engines were built by the North British Locomotive Co. Ltd. Glasgow, in 1936; they have 4 ft. coupled wheels and a boiler pressure of 210 lb. per sq. in. Their equipment includes two thermic syphons and superheater. "Pacifics" for hauling the Pullman, dining and sleeping car trains between St. Johns and Port-aux-Basques, which do not run every day, were constructed by the Baldwin Works some 15 years ago.

Famous Inventors

Thomas Alva Edison

I—Early Days and the Telegraph

THOMAS ALVA EDISON was born at Milan, Ohio, on 14th February 1847. His family was of Dutch origin. To his father Samuel Edison he owed his remarkable physique and his extraordinary powers of endurance; from his mother he inherited the ceaseless intellectual activity that characterised him throughout his life. To his mother, too, he owed all the general education he ever received, for he spent only three months at school, where the teacher asserted that he was "addled!"



Thomas Alva Edison at the microphone in 1928.

Edison was an experimenter from his early childhood, and by the age of ten he had set up a chemical laboratory in the cellar of his home. Chemicals and apparatus cost money, and before long he began to raise this by selling garden produce. Later he sold newspapers on the train. In a compartment that he got permission to use he set up chemical apparatus, and a small printing plant with which he produced a weekly newspaper of his own, probably the first paper to be printed on a train in motion. This paper, called the "*Weekly Herald*," reached a circulation of over 600 copies a week. Then came disaster. By some mischance he set the compartment on fire. The flames were extinguished before much damage was done, but the train conductor, who up to that time had been his friend, lost his temper and threw him out at the next station with all his apparatus and equipment. This was a bad setback, but the boy was undismayed, and he continued his experiments in the home cellar.

When Edison was fifteen he happened to save the life of a station-agent's child, and in gratitude the agent taught him train telegraphy. He tackled this subject with great enthusiasm, and by the age of sixteen he had become a competent operator, and soon obtained a situation on the Grand Trunk Railway. He was on duty from 7.0 p.m. to 7.0 a.m., and from 9.0 p.m. onward he had to send a certain signal every hour to the train dispatcher's office to show that he was awake. This arrangement did not appeal to Edison, who was often very sleepy as the result of experimenting during the day when he should have been resting; so he devised an arrangement that automatically sent out the required signal each hour. Unfortunately this scheme was found out and a sharp reprimand followed. After holding positions in telegraph offices in five different States, he joined the staff of the Western Union Telegraph Company, and so ended his railway career.

In 1849 Edison took out his first patent. This was for an electric vote recorder intended for use in the House of Representatives to speed up the recording of votes. To his disappointment he found that speedy vote recording was about the last thing desired in the House, and sadly he determined never again to waste time on inventions for which there was no demand.

Soon afterwards Edison went to New York where he arrived practically penniless. One morning, while in search of work, he happened to drift into the offices of the Laws Gold Indicator. This was an electrical device for showing the changing gold quotations, and consisted of a stock quotation printer in a central office connected with indicators in hundreds of brokers' offices. On this particular morning it happened that the central instrument had broken down so that all information regarding gold prices suddenly ceased,

causing general panic. While workmen were frantically searching for the cause of the breakdown Edison managed to get close to the instrument and quickly saw what was wrong. "I think, Mr. Laws," he said quietly, "I can show you where the trouble lies." Then he picked up a broken contact spring that had fallen between two gear wheels. Laws was greatly impressed, and after a couple of interviews, during which he asked a host of questions, he appointed Edison to take charge of the whole plant.

After making various improvements to the system Edison took out his first really important patent, for the Edison Universal Printer, a tape machine that came into extensive use in many countries. Soon afterwards Marshall Lefferts, president of the Gold and Stock Telegraph Company, sent for Edison and asked him how much he would take for his inventions. The inventor hesitated, and the sum of 5,000 dollars occurred to him. Eventually he decided to ask Laws to make him an offer, and to his utter amazement the president suggested 40,000 dollars! Two days later the contract was signed and he received a cheque. He took this to the bank, but the teller refused to pay without someone to identify Edison. This difficulty was soon got over and the teller paid out. Edison was now possessor of a huge bundle of bills which he carried about with him for two days, worried to death lest they should be stolen. Then a friend came to the rescue and explained to him how to deposit the money in a bank, and so the inventor opened his first bank account.

Edison as a boy.

The Edison Universal Stock Printer.

He was now financially independent, and his first step was to open a factory in Newark, New Jersey, where he manufactured electrical apparatus of various kinds, including tape machines for the Western Union Telegraph Company. Here he showed the tireless energy that was his most striking characteristic. He worked incessantly, taking only a half-hour sleep three times during the 24 hours.

Before he had been in Newark long the Automatic Telegraph Company asked him to improve their circuit between New York and Washington. In the system used by the company the messages were prepared in the form of a series of perforations in a narrow paper ribbon, corresponding with the dots and dashes of the Morse code. This ribbon was passed through a transmitter in such a manner that an electric circuit was completed each time a perforation passed, and a current from a battery was sent to the receiver at the other end of the wire. In this receiver the current acted on another travelling paper ribbon, which was chemically prepared so that each electrical impulse marked upon it either a dot or a dash. The message in Morse thus recorded was then translated. Edison made many important improvements in the system, and later invented a receiving instrument in which the messages were recorded, not in dots and dashes, but in ordinary letters, thus doing away with the necessity of translation from the Morse. In connection with this system Edison came to England to give a demonstration to the British Post Office. The trials were successful (*Continued on page 194*)

Photography

How to Prevent Faults

By S. E. Low

NEVER destroy a faulty negative until you know why it is faulty. Your "dud" negatives are mines of information and the purpose of this article is to help you to extract information from them and to learn by your mistakes.

Perhaps the most annoying of photographic faults is unsharpness in the picture. Unsharpness is of several kinds, two or more of which may occur in the same negative. One kind arises from the image being out of focus, due to misjudgment of distance, incorrect setting of the focussing scale, or to approaching nearer than 10 ft. from the subject when using a camera fitted with a single lens. More rarely the unsharpness may be due to a faulty focussing scale, incorrect register of the film or plate, or to the components of the lens being misplaced. In the case of a miniature camera with coupled range-finder and focussing scale, unsharpness may be due to the coupling being out of adjustment. This is unusual, but is the sort of thing which may happen when the camera is dropped or knocked violently.

Another kind of unsharpness is caused by movement of the camera during exposure. Even though your exposure is a snapshot and fast enough to arrest the movement of people walking about, wind blowing the branches of trees, etc., it is not likely to arrest the abrupt movement of the image which occurs if the camera is jerked when the shutter is released.

An unsharpness somewhat similar to camera-shake is obtained, in the case of moving objects, if the shutter is too slow; the image of the moving object has time to move on the plate or film while the shutter is open. This occurs chiefly with objects crossing the line of sight and, of course, affects the moving part of the subject only. To avoid it you need to use a faster shutter exposure to "snap" the subject as it approaches.

Light may enter a pinhole in the bellows of a folding camera and produce characteristic areas of light fog like this.

Light-scattering and "lens flare" caused by photographing directly into strong sunlight.

There is also another kind of unsharpness, which is really diffusion of a sharp image, and may be caused by dirt on the lens, or by the lens becoming clouded when brought from a cold atmosphere into a warm one. If your camera has been laid aside during the winter, dust it thoroughly (to prevent dust settling on the film and so causing "pinholes" in the negative) and clean the lens with a soft handkerchief.

Faults of exposure are to a very large extent compensated by the extraordinary latitude of good photographic products such as Selo films, and can be further corrected by choice of the right grade of Selo paper when the print is made.

Edge fog has become a rarer fault owing to the improvement of the spool paper used for roll films, but it does occur sometimes. Although roll films are "daylight loading," they should never be loaded or unloaded in strong sunlight.

What has happened to the accompanying photograph of a Cornish fishing harbour? The picture was taken fairly late in the day on Hypersensitive Panchromatic Roll Film (which is particularly sensitive to the reddish light of the last hour before sunset). But the camera was pointed directly towards the sun and strong rays of light have been reflected from the glass-air surfaces of the lens and have caused this fogging owing to scattering of the light.

Light fogging is again to blame for the white blobs which appear on the mountain picture; but in this case light has entered the camera through a tiny crack in the bellows of a folding pocket camera. The white blobs may occur on, perhaps, only one negative on a spool, and sometimes several spools will be immune from the fault while the next spool may show it on every negative. The reason for this erratic appearance is that the fogging is most likely to occur when the camera has been used in sunshine, and depends upon the angle of light rays passing through the tiny aperture in the bellows; it further depends upon the intensity of the light and how long the camera is left open.

"Telegraph wires" are fine, clear lines running the length of a band of roll film—caused by friction of the emulsion surface against rusty guide rollers or against dust or grit on the latter; also may be caused by the guide rollers being jammed and refusing to revolve as the film is wound across them.

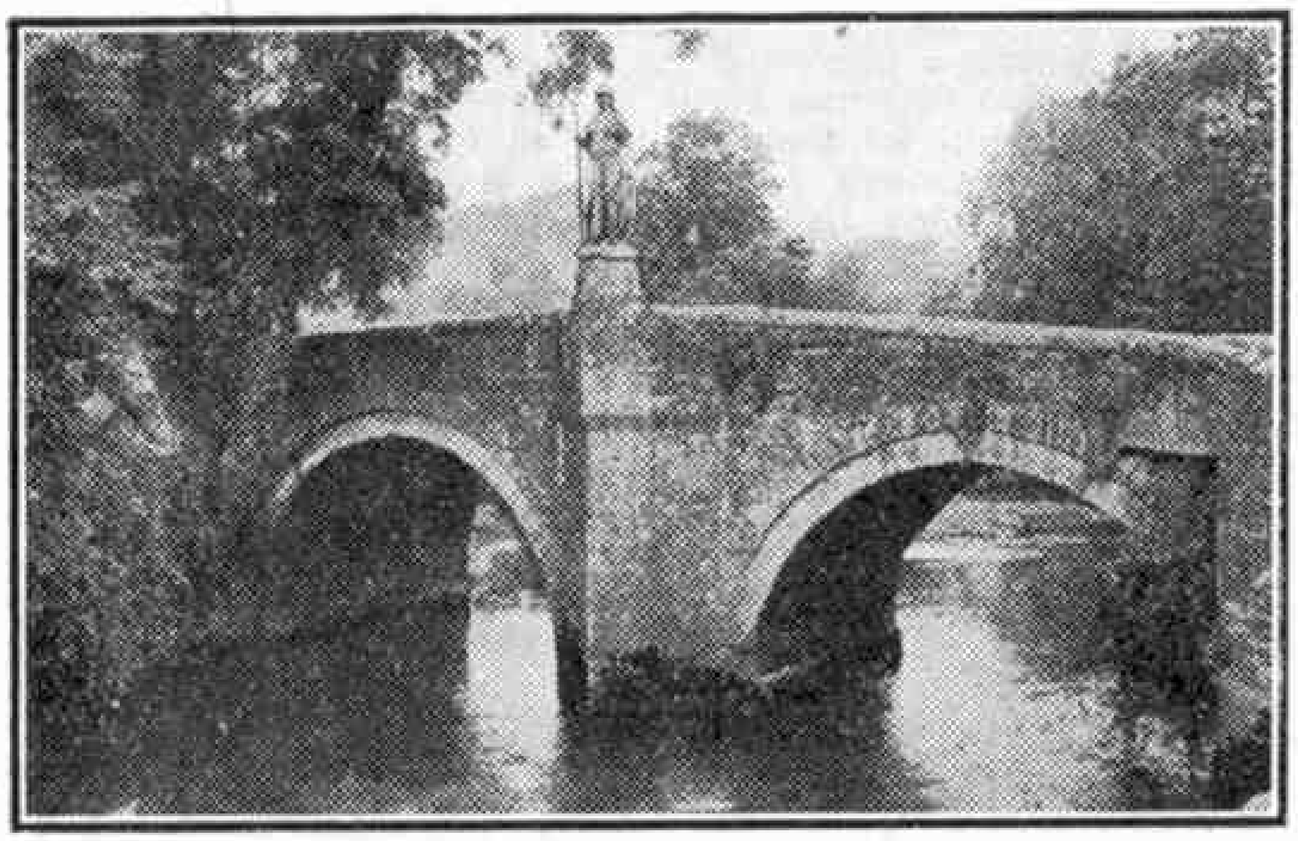
Torn or cockled edges of a roll film spool are caused by misalignment in the camera. Often this fault is accompanied by edge fog, due to light entering where the spool paper was torn.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

AN INTERESTING OLD BRIDGE

The bridge illustrated on this page is a 14th century structure at Iford, on the border between Somerset and Wiltshire. It is substantial, being capable of taking ordinary modern traffic, and is unique in possessing a figure of "Britannia" mounted on its parapet. Presumably the statue marks the dividing line between the two counties, for the river Frome, crossed at this point by the bridge, is the boundary between them. H. A. SUMMERS (Keynsham).



The 14th century stone bridge over the Frome at Iford, unique for its figure of Britannia. Photograph by H. A. Summers, Keynsham.

A HOLIDAY ON THE VAAL

I spent part of a recent holiday at Parys, a picturesque spot on the Vaal river, in the Orange Free State. Large weirs across the river make parts of it ideal for boating, swimming and fishing, while farther up the river islands and rocks give opportunities for exploring and rock-climbing.

I was lucky enough to encounter three friends, with whom I made a round of the attractions of the place. A picnic to Loch Vaal was a great success. This is a large sheet of water formed by the Vaal Barrage, one of the important parts of a large scheme to provide water for the Rand. Loch Vaal was the only point I saw on the river where the water appeared blue. Elsewhere it is brown in colour, this being the reason for its name, for "vaal" in Afrikaans means tawny, and the name is indeed an excellent description.

The only untoward incident in a glorious holiday was when two of us fell into the river when a rock shifted under our feet. Before we left we saw an impromptu aerobatic display over the river, given by two Hawker "Harts."

R. M. GAMESON (Johannesburg).

BRITISH SONG BIRDS

Now is the time of the year to listen to songbirds in the garden. Britain possesses many capable songsters, and one of our most familiar birds, the blackbird, is second to none in this respect. It builds its nest in any wood, copse or thicket and even in our gardens, constructing it of grass and roots, with a foundation of mud, and lining it with grass. Most of the song of the blackbird consists of trills and whistles and it is rich and sweet.

By way of contrast is the song of the goldcrest, commonly described as the smallest European bird, for this closely resembles the tinkling of a small bell. The goldcrest is found in most localities where there are plantations of larch or fir. The nest is hung underneath a branch, and usually is built of moss and spiders' web.

G. F. W. LOCK (Carshalton).

HAVERHILL TOWER WINDMILL

Mechanically as well as historically the old style windmill is a thing of interest, with a real beauty of its own, and it is much to be regretted that so many of our old mills are rapidly disappearing. The windmill at Haverhill, Suffolk, shown in the lower illustration on this page, is totally different from the usual type. Instead of the usual two or four sails, it has a huge circular iron wheel, measuring 20 ft. across, on which there are 120 vanes. Each vane is 5 ft. long and 1 ft. wide.

This mill is an eight-storied tower type standing 70 ft. in height and besides being a landmark for miles around, it is almost the largest windmill in the country. Two similar mills were built in this district, but these have disappeared, leaving Haverhill one of the most remarkable still working.

H. CHARLES (London N.W.2).

The unusual tower windmill at Haverhill, Suffolk. Photograph by H. Charles, London N.W.2.

Air News

A New Transatlantic Service

American Export Airlines have obtained authority from the U.S. Civil Aeronautics Board to operate a transatlantic air service. A temporary certificate has been granted to the company on the grounds that an additional transatlantic air service has become necessary in the interests of national defence. It will allow the company to operate between New York and Foynes, Eire, with stops for refuelling at Bermuda, Horta, in the Azores, and Lisbon. Operation of the service by the direct Northern route is also permitted.

The big four-engined Vought-Sikorsky flying boats on order for the company will be employed for these transatlantic flights. The first of these three boats has been launched, and was test-flown early this year. It has been named "*Excalibur*" by Mrs. H. E. Wallace, wife of the Vice-President of the United States. The boat is fitted with four 1,200 h.p. Pratt and Whitney "Twin-Wasp" engines, and at a cruising speed of 175 m.p.h. it has a range of about 3,200 miles, with 40 passengers and a crew of 11 aboard.

Underground Aircraft Factories

The protection of aircraft factories from air attack is of vital importance, and one method being adopted to achieve this is the establishing of such factories underground. Each of these remarkable plants, with its surface hostels for the workers, its recreation centres, and shops, is a self-contained community. Two big problems which had to be dealt with in these factories have been lighting and ventilation. The fluorescent lighting system adopted gives a brilliant illumination almost equal to daylight, and the ventilating system includes air conditioning plant and huge ventilator shafts which distribute the flow of air by ducts to the offices and workshops. One of these fine underground factories used to be a mine, and another has been created in what was once a quarry.

"Engliski Aeroplanski"

"English Aeroplanski" means nothing, either in English or Russian, but it meant a lot to the telephone operator in a village near the Northern Russian front where the R.A.F. Wing was operating for some time. This operator was a Russian blonde named Anya. When she first heard English voices speaking into the telephone she was thrown into confusion. She knew no English. The British, with the exception of three Russian-speaking officers, knew no Russian. But R.A.F. lorry drivers who got snowed up, or who drove into drifts in the darkness, had to find some way of communicating with their headquarters. Feeling that adding "ski" to any word made it look Russian, they improvised the phrase "Engliski Aeroplanski" when they picked up a telephone; and soon that phrase meant to Anya that the speaker wished to communicate with headquarters of No. 151 Wing, R.A.F.

* * * *

Internal air services in the United States carried a total of over 4,000,000 passengers last year.

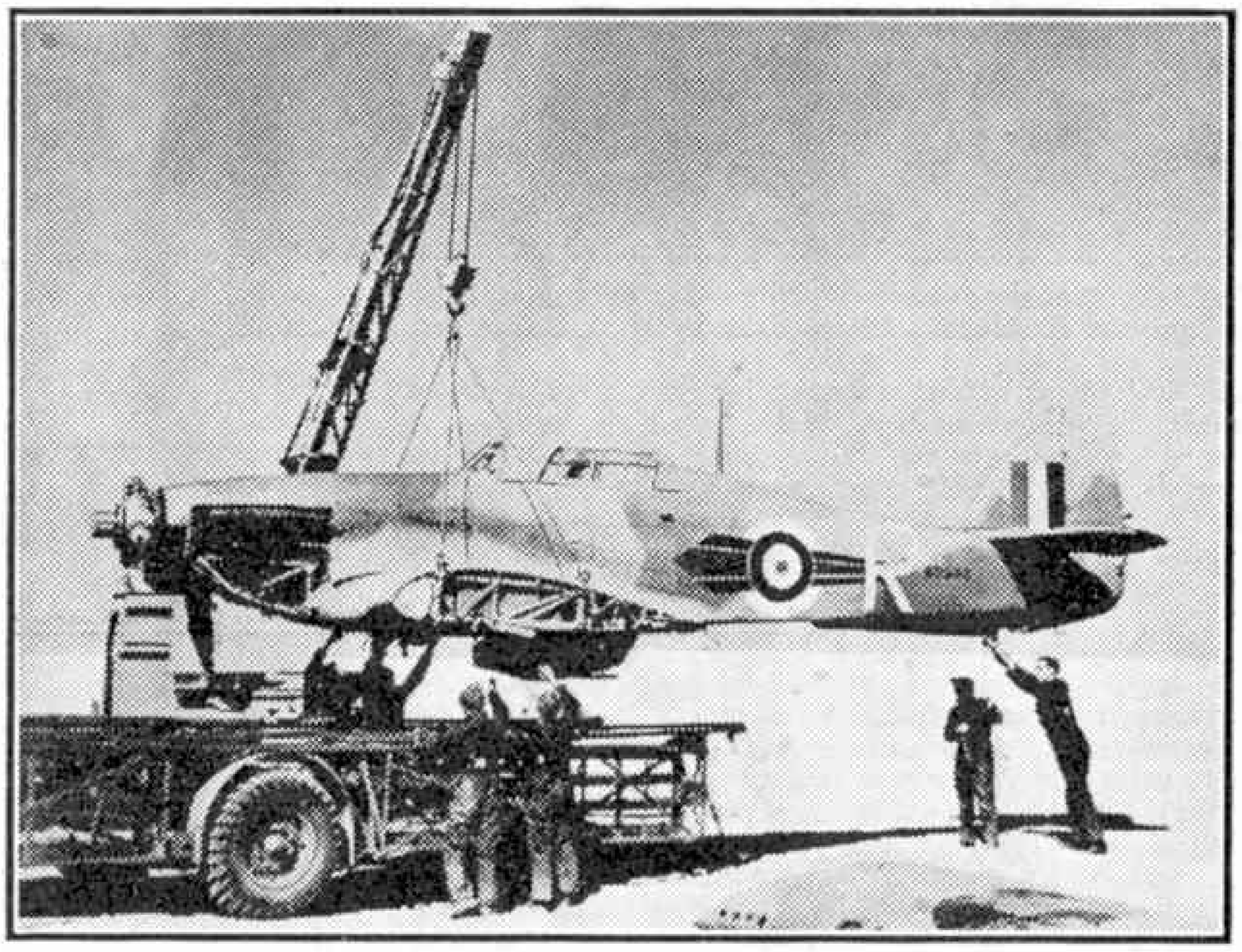
Famous Veteran Aircraft to the Rescue

Aircraft employed in evacuating women and children from New Guinea included the late Capt. C. T. Ulm's famous old Avro Ten "*Faith in Australia.*" In this triple-engined monoplane he made his record flight from the United Kingdom to Australia in 1933, and the next year flew in it from Australia to New Zealand, another record at that time.

When required for the evacuation work this historic Avro was at the Wau Goldfields in New Guinea, where a pilot and a mechanic worked on it for a whole day and night, making it fit for its new job. In spite of their anxiety as to its ability to climb high enough to clear the Owen Stanley range of mountains, the machine was flown over them safely to Port Moresby, in Papua.

A much longer flight to safety was accomplished by Mr. M. Blackman, a Guinea Airways pilot, who, with a gold miner as passenger, took off from Wau in a 15-year old D.H. "Gipsy Moth" and flew 800 miles to Townsville, in Queensland, Australia.

Other old aircraft pressed into service for the evacuation work included a "Gannet."



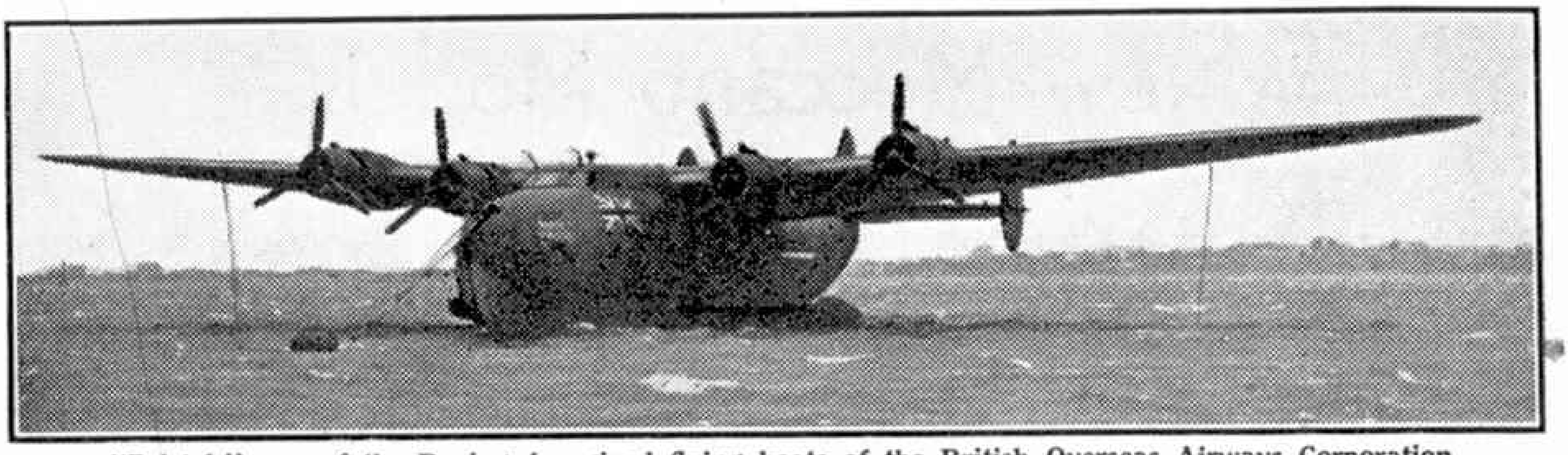
R.A.F. Repair and Salvage Work in the Middle East. Hauling a damaged aeroplane on to a tender. (See special article on page 165).

Troop-Carrying by Glider

Troop-carrying in towed gliders may play an important part in the offensives of the Allied nations, and the military authorities in this country and in the United States are giving great attention to this method of air transport.

Here the War Office have announced the formation of an Army Air Corps, and have begun by allocating to it a regiment of glider pilots. Parachute troops are not yet brought within the new Corps.

In the United States a new Command has been created to extend the training of parachute troops, and to put in hand the training of air-borne ground forces. The United States Navy Department have ordered 14 experimental gliders, some of which will be 24-seater troop carriers designed for towing through the air. Two-seater training gliders are also being produced in that country.

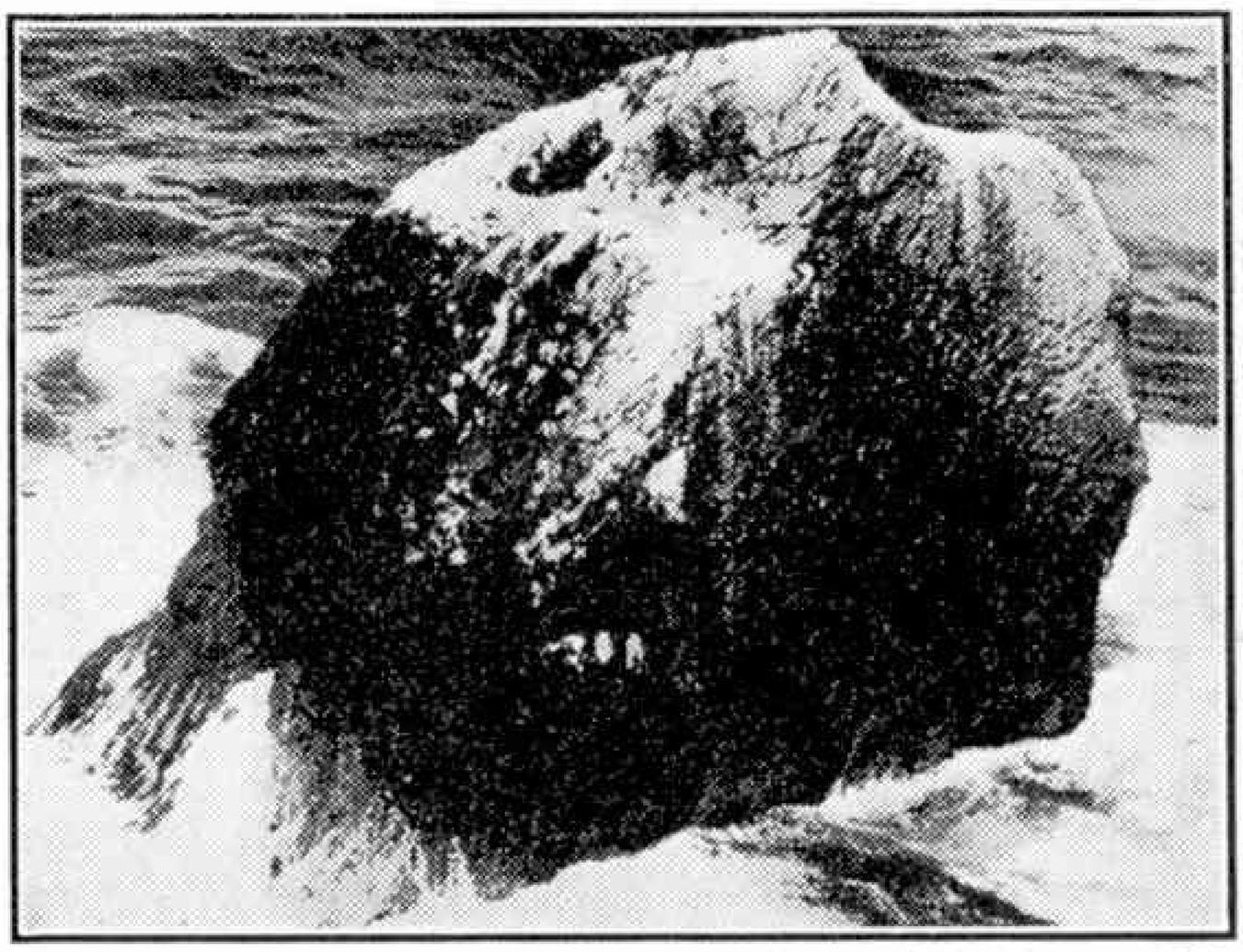


"Bristol," one of the Boeing 4-engined flying boats of the British Overseas Airways Corporation.

R.A.F. Pilots Photograph Bird Life on Ocean Islet

Some R.A.F. Coastal Command pilots who recently hunted a German U-boat in the Atlantic succeeded in furthering the interests of ornithology with almost as much zest as they had attacked the submarine.

It was the secretary of a learned society who first made the pilots "bird conscious." In April last year he wrote to the Air Officer Commanding a Coastal Command Group reminding him that far out in the Atlantic, more than 150 miles west of lonely St. Kilda, was a barren volcanic rock known as Rockall, on which it was known, were many birds. The rock had never been photographed from the air, and few people had ever set foot upon it. In consequence the society had little data about the bird life there and the information that existed was obscure and conflicting. The secretary therefore asked the A.O.C. if any of his aircraft were likely to be in the neighbourhood and, if so, would the crews make observations and take photographs. The A.O.C. readily agreed, as the long-range flying boats and land aircraft always take cameras as well as bombs out over the Atlantic.



Near view of Rockall, the lonely island in the Atlantic, over 150 miles west of St. Kilda, photographed from the air by Coastal Command, R.A.F.

The crews know Rockall well. Many a navigator trying to get a bearing on his position in bad weather has blessed the friendly, but rugged mound as it loomed up out of the mist, the only solid object for scores of miles, in an expanse of heaving, restless water.

Low down over the rock and round it circled the aircraft as they returned from their patrols. Camera shutters clicked. Rockall was photographed from every conceivable angle, and the inhabitants of the rock did not seem to mind this intrusion into their privacy. "I think the birds must have liked having their photographs taken," said one pilot. "They almost seemed to pose for us." Thus the ornithologists got their pictures of Rockall, one of which is reproduced on this page. Members have studied them carefully and have been able to identify clearly gannets, guillemots, and kittiwakes.

"Catalina" in Gale

A "Catalina" flying boat of the R.A.F. Coastal Command was out on a reconnaissance flight in a gale. The boat pitched and tossed like a giant swing-boat, and the 20-year old pilot sat hunched over the controls, his arms aching as he endeavoured to keep the boat steady. Every man on board was air sick.

By the light of the moon the pilot saw, 9,000 ft. below him, an island that enabled him to calculate his position, but a minute later cloud closed round the "Catalina" and he was flying blind. His air speed indicator showed 90 knots.

For more than half an hour the engines droned on, keeping the aircraft steadily at that speed. Then the clouds fell away. The pilot again looked down—and gazed in astonishment. There, 9,000 ft. below him, was the same island he had seen about 40 min. earlier. It meant that for that time the "Catalina," cruising at an air speed of over 100 m.p.h., had hung stationary in the air, making no headway against the gale.

When he recovered from his surprise the pilot put the "Catalina" in a shallow dive and managed to press forward, but finally he turned out of the gale and made his way back, flying crabwise against a cross wind of more than 90 knots. Struggling with the controls was exhausting work. He needed a reviver, but the cook was unable to make hot coffee because he could not stand upright in the heaving aircraft.

Cloud again closed in round the "Catalina" and the pilot had to fly blind once more. Ice gripped the instruments. One by one they froze up and played tricks. Several hours before dawn the pilot made his base, but he decided it was too risky to land in a howling gale while it was still dark, and therefore circled the station until daylight, when he got down safely. He had been at the controls for 16 hrs. 20 min. Even then it was a further hour before a launch could approach near enough to get the crew off the "Catalina," and when they did get ashore every man required minor medical attention.

And at 08.00 hrs. that morning this entry was made in the station log—"the wind has now reduced to gale force."

* * * *

The Piper Aircraft Company, U.S.A., have completed their 10,000th Piper "Cub" light aeroplane.

New Meccano Models

A Realistic Tank and a Motor Boat

MANY fine working models can be built with the contents of the No. 4 Outfit, and an excellent example of these is the military tank shown in Fig. 1. This is driven by a No. 1a Clockwork Motor, and is fitted with a power-operated gun turret. It is easy to build and will give its constructor real fun and amusement.

In building the model it is best to commence with the superstructure. For this two 12½" Strips are attached by two Double Brackets at their forward ends to further 12½" Strips to form two 12½" compound angle girders 1. Two ½" Reversed Angle Brackets make the attachment at their rear ends. They are spaced apart by a 4½" Hinged Flat Plate 2 and a No. 1a Clockwork Motor 3, attached to them by Flat Brackets. Two 2½" × 1½" Flexible Plates 4 are bent to the shape shown and are connected by Angle Brackets and 2½" Strips to two 2½" × 2½" Flexible Plates 5 bolted to the forward end of the Motor. An Obtuse Angle Bracket is bolted to the Flexible Plates 5 and on this rests the remaining half of the Hinged Plate 2, which forms the entrance to the tank. The space at each side of the entrance is filled in by a 2½" Strip and a Flat Trunnion fixed in the positions shown. The sides of the superstructure are formed from 3½", 2½" and 5½" Strips, which are bolted to the Plates 4 and attached to the Motor by ½" × ½" Angle Brackets.

The chassis is constructed by bolting a 4½" × 2½", a 5½" × 2½" and a 2½" × 2½" Flexible Plate to each of the built-up girders 1 by means of three 2½" × ½" Double Angle Strips, to the lower ends of which are attached 5½" Strips to form the dummy creeper track. These are held in place by ⅜" Bolts and spaced by a Spring Clip. The 4½" × 2½" Flexible Plates 6 at the forward end provide bearings for a 4" Rod, which carries two 3" Pulleys forming the front sprockets, and they are braced by a 3½" Strip attached to them by ½" × ½" Angle Brackets. This Strip is fixed to two U-section Curved Plates that are overlapped and attached to the Plate 2.

The driving sprockets are Road Wheels mounted on the ends of two 2" Rods joined by a Rod Connector. The 4" compound rod formed in this manner is journalled in two Semi-Circular Plates, which are attached to the chassis and to two 3" Formed Slotted Strips by two ½" × ½" Angle Brackets. The Formed Slotted Strips are also bolted to the compound girders 1. The idling sprockets are 1" Pulleys fixed on a 4" Rod journalled in the 5½" × 2½" Flexible Plates attached to the Plates 6 and to the 2½" × ½" Double Angle Strips 7. Construction of the chassis is completed by overlapping two large radius Curved Plates three holes and bolting them to the rear end of the Motor.

The rotating gun turret consists of two 4½" Flanged Sector Plates joined at their forward ends to a 2½" × 1½" Flanged Plate. The heavy quick-firing gun is a 3½" Rod held by a Cord Anchoring Spring in the 2½" × 1½" Flanged Plate, a Trunnion bolted to the lower Flanged Sector Plate, and a Cranked Bent Strip. A strip of paper should be gummed around the Rod to enlarge its diameter. The Cranked Bent Strip is also mounted on a 3½" Rod, with which the turret rotates. This Rod is fixed in the boss of a Bush Wheel bolted to the lower Flanged Sector Plate, and is journalled in the Plates 5 and the Clockwork Motor sideplates. The rear machine gun in the turret is a 1" Rod held in a Rod Connector bolted to the upper Flanged Sector Plate and passed through the centre hole of a 1½" × ½" Double Angle Strip. The Double Angle Strip and a Trunnion are bolted to the upper and lower Flanged Sector Plates to fill in the rear of the turret. The sides are filled in by attaching 2½" Strips to the 2½" × 1½" Flanged Plate, and the turret is completed by fixing two 1¼" Discs to the top to form the gunner's manhole.

The drive from the Clockwork Motor is transmitted to the track by a Driving Band passed around the driving shaft of the Motor and a 1" Pulley on a 3½" Rod journalled in the Double Angle Strips 7. The Band is prevented from slipping off the Rod by a Spring Clip and Washer. A length of Cord connects a second 1" Pulley on the 3½" Rod to a similar Pulley on the compound shaft of the driving sprockets. A further 2½" Driving Band should be placed around the 3½" Rod of the gun turret and also around the winding shaft of the Motor, to transmit a slow drive to the turret. This Driving Band is prevented from slipping off the Rod by a ⅜" Disc and Spring Clip.

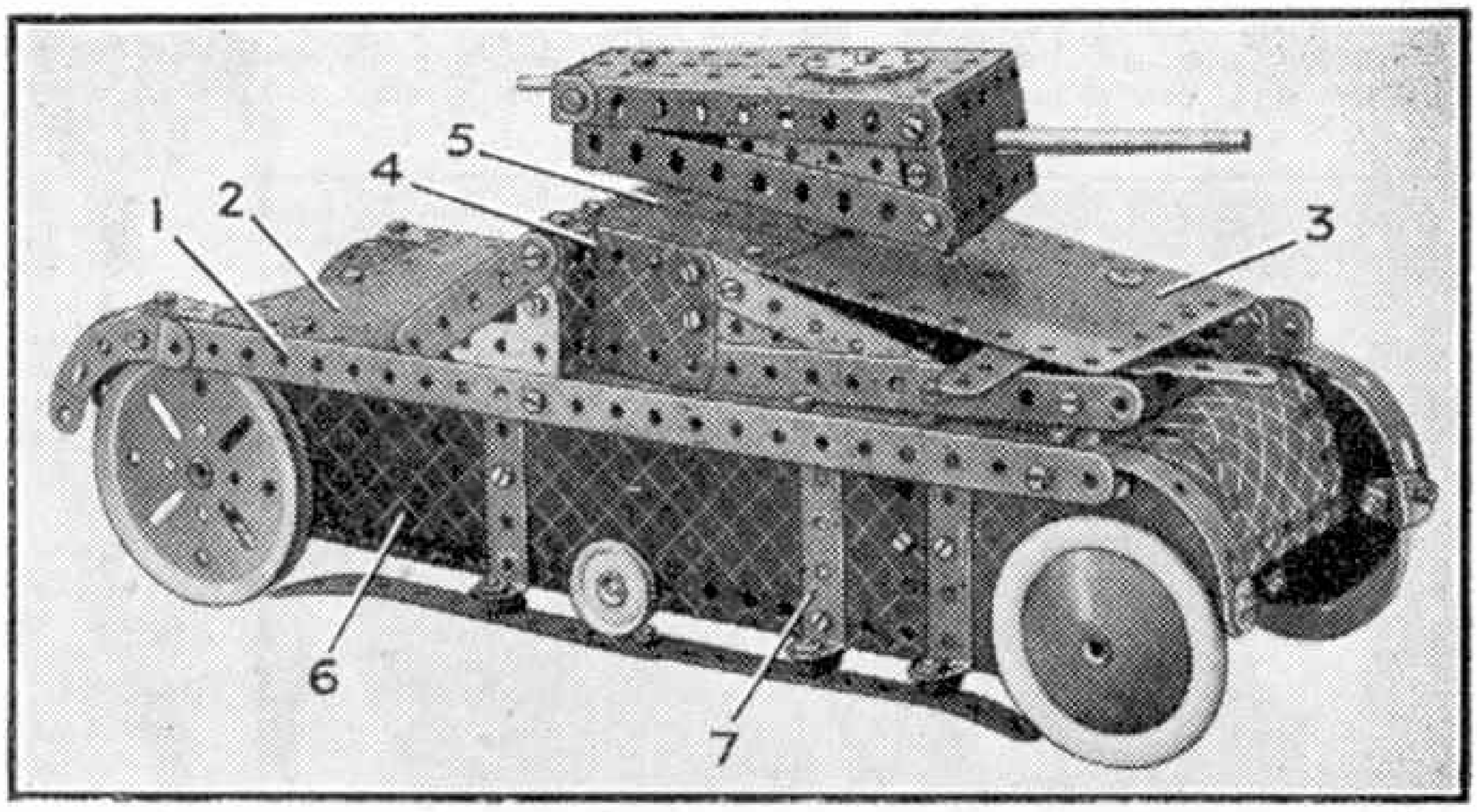


Fig. 1. A splendid tank, with a power-operated gun turret, that can be built with the parts in the No. 4 Outfit.

Parts required to build model tank: 4 of No. 1; 7 of No. 2; 2 of No. 3; 8 of No. 5; 4 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 12c; 2 of No. 15b; 3 of No. 16; 2 of No. 17; 1 of No. 18b; 2 of No. 19b; 5 of No. 22; 1 of No. 23; 1 of No. 24; 8 of No. 35; 81 of No. 37a; 75 of No. 37b; 8 of No. 38; 1 of No. 40; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 2 of No. 54a; 4 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 1 of No. 186; 2 of No. 187; 2 of No. 188; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 2 of No. 199; 2 of No. 200; 1 of No. 212; 1 of No. 213; 2 of No. 214; 4 of No. 215; 2 of No. 217a; 2 of No. 217b; 1 No. 1a Clockwork Motor and 1 2½" Driving Band (not included in Outfit No. 4).

Our second model is the model motor boat, driven by a *Magic* Motor, that is shown in Fig. 2 on the next page. This is fitted with a simple device that makes it ride realistically over the "waves" when set in

motion, and it can be built from the parts in Outfit No. 2.

Two 5½" × 1½" Flexible Plates 1 are bolted together at their forward ends and are attached at their rear ends to a 5½" × 2½" Flanged Plate 2, the space between them being filled in by two 2½" × 1½" Flexible Plates and a Flat Trunnion. Two 5½" Strips bent slightly are bolted to the Plates 1 at their rear ends and attached to them at their forward ends by means of a Flat Bracket. A 5½" Strip 3 lengthened by a 2½" Strip bolted to it is attached at each side to the bows and to the Plate 2 by a Flat Bracket. A 2½" Strip is bolted to each of the Strips 3 and to the Flexible Plates 1, as shown in Fig. 2.

Two 2½" × ½" Double Angle Strips 4 are bolted to the Plate 2, and to the rear ends of these is bolted the *Magic* Motor, which is also secured by ½" × ½" Angle Brackets to the 2½" Strips connected to the Strips 3. A large radius Curved Plate is bolted to the Plate 2 and is attached to the forward edge of the Motor, to the rear edge of which is bolted a U-section Curved Plate. The stern of the boat is completed by attaching a 2½" Strip to each of the Double Angle Strips 4.

The seats are Trunnions attached to 2½" Cranked Curved Strips fixed to Plate 2; the rear seat is secured to the Double Angle Strip 4 at each side and the forward one by means of ½" × ½" Angle Brackets.

The Motor is connected to the model by passing a 2½" Driving Band around the driving pulley of the Motor and also around a ½" fixed Pulley mounted on a 3½" Rod 5 journalled in the Double Angle Strips 4. This Rod carries two 1" Pulleys shod with Rubber Rings. The riding motion of the model is obtained from a cam that is mounted loosely between Spring Clips on a 2" Rod 6 held in the Flexible Plates 1. This cam consists of a 1" Pulley, fitted with a Rubber Ring. A Cord Anchoring Spring is inserted between the Rubber Ring and the Pulley so that the grooves in it rest on the rims of the Pulley.

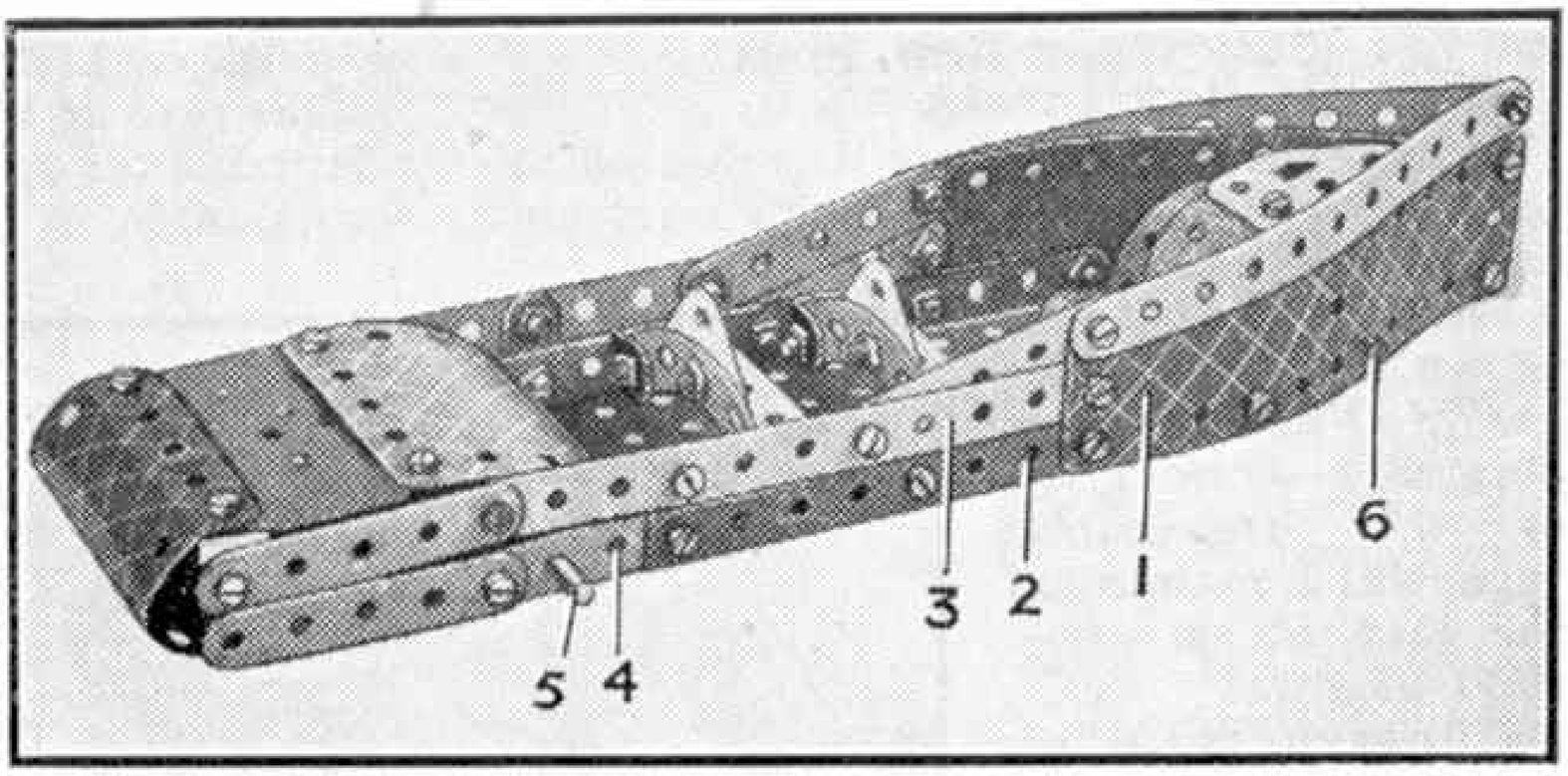


Fig. 2. This fine model motor boat "rides the waves" realistically when its motor is started. It is built with the contents of No. 2 Outfit, with the addition of a Magic Motor.

Parts required to build model motor boat: 4 of No. 2; 6 of No. 5; 3 of No. 10; 4 of No. 12; 1 of No. 16; 1 of No. 17; 3 of No. 22; 4 of No. 35; 40 of No. 37a; 40 of No. 37b; 4 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 126; 1 of No. 126a; 3 of No. 155a; 1 of No. 176; 2 of No. 188; 2 of No. 189; 1 of No. 199; 1 of No. 200. 1 *Magic* Motor (not included in Outfit).

Aircraft Model-Building Competition

There is still time to enter this fine competition, in which reproductions in Meccano of aircraft of any kind are invited, as entries can be received up to the end of May. The subject is an attractive one, for all model-builders delight in building miniature aeroplanes with their Outfits, and there are splendid prizes for those who are successful. The first prize-winner will receive a cheque for two guineas, and the second and third prizes are one guinea and 10/6 respectively. There are sure to be many entries other than those of the principal prize-winners that will deserve recognition, and in order to allow for this five other prizes, each of 5/–, will be awarded.

No restriction is placed on the kind of aircraft that can be reproduced in entries for this contest. Aeroplanes of all kinds, including seaplanes, fighting boats and helicopters, can be submitted, and airships and gliders also are eligible, while there is no limit to size, so that owners of small Outfits will have as good chances of success as those with larger resources. The many examples of aircraft models that have been illustrated and described from time to time in the "*M.M.*" have shown that small models can be as realistic and accurate as large ones.

Although models must be built with Meccano, parts from Aeroplane Constructor Outfits can be introduced where their use is advantageous. The only restriction is that the main parts of the models must be built from ordinary Meccano parts.

Competitors are asked to send in either photographs or good drawings of their models, together with brief descriptions of any specially interesting features. There will be two sections, A for competitors over 14 years of age, B for competitors under 14, and the ages of competitors will be taken into consideration in making the awards. Entries should be addressed "*Aircraft Competition, Meccano Ltd., Binns Road, Liverpool 13,*" and each entrant must remember to write his name, age and address, together with the letter indicating the section in which he is entering, on each sheet of paper or photograph sent in. Entries should be posted to reach this office by the end of May.

Suggestions Section

By "Spanner"

(548) Worm Gear Hoist

(T. Hughes, London N.W.1)

In many instances where it is desired to handle a comparatively heavy load quickly and easily, a gear hoist of the type shown in Fig. 548 is used. This incorporates a worm gear of the irreversible type, which maintains the load at any desired height.

Construction is commenced with the frame for the gear train. Two Flat Trunnions are spaced apart by two 1½" × ½" Double Angle Strips and two Washers, and two 1½" Flat Girders are bolted through their elongated holes to the Double Angle Strips. The Flat Girders are made rigid by a 2" Screwed Rod. Two 2½" Strips are bolted to the Flat Trunnions, and these are also made rigid by a 2" Screwed Rod on which a Hook is secured.

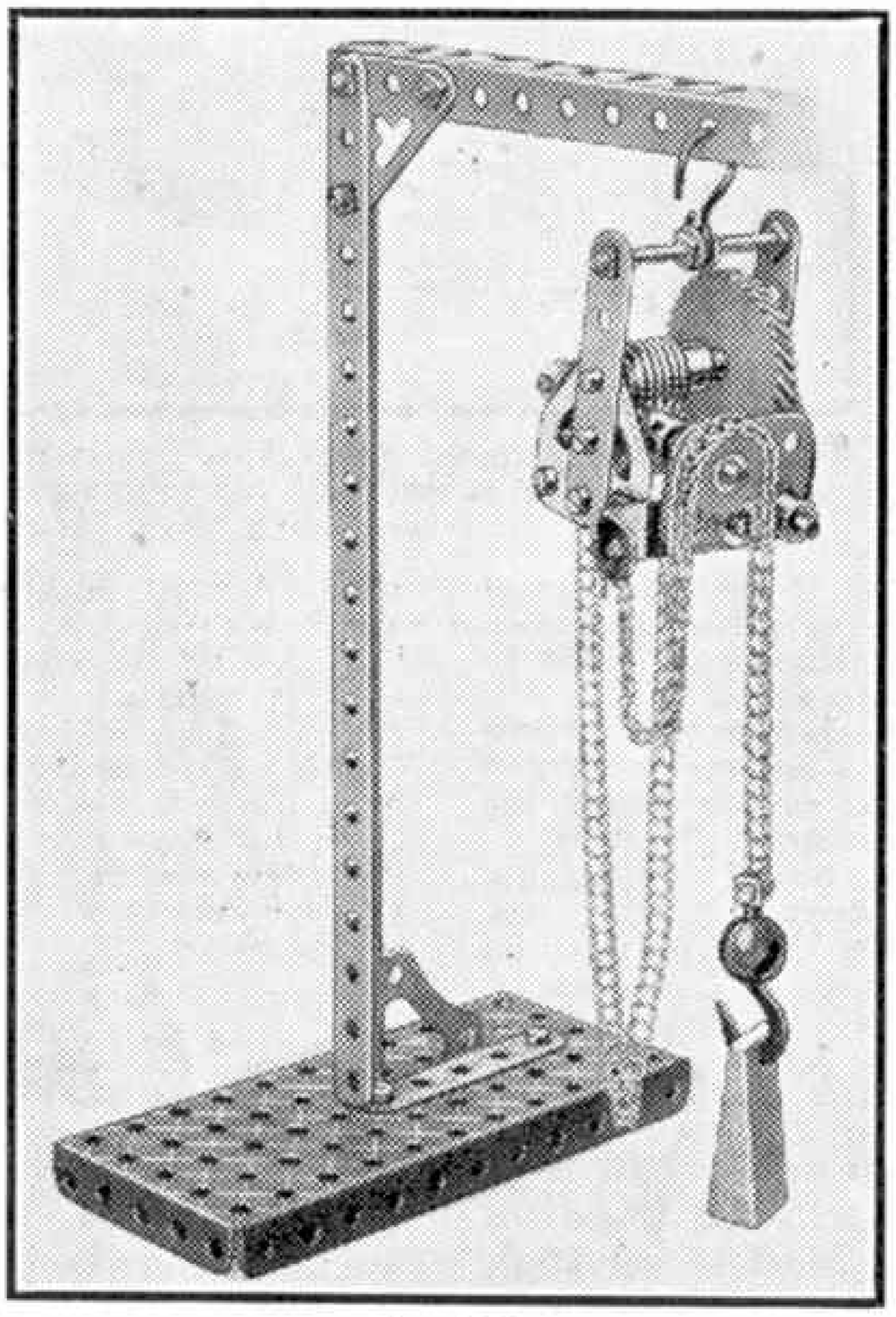


Fig. 548.

The operating Chain is passed over a 1" Sprocket mounted on a 2½" Rod that also carries a ½" Helical Gear. The Gear meshes with a 1½" Helical Gear on a 2" Rod, on which is a Worm. The Worm meshes with a ½" Bevel Gear that is secured on a 2½" Rod, which carries the winding drum, a ¾" Sprocket. The Chain for raising and lowering the load is fastened by means of a short length of Cord to a ½" Reversed Angle Bracket bolted to the frame, and the other end of the Chain is passed over the winding drum and bolted to a Large Loaded Hook.

This type of lifting tackle is particularly adaptable for operating in a fixed position, for example, in loading a wagon or feeding a hopper. If it is required to transport a load from one position to another it should be mounted on a carriage running on the lower flanges of an H-section Girder spanning from one to the other. The carriage should consist of 2½" Triangular Plates bolted to the gear train casing, with ⅞" Flanged Wheels locknutted to the Plates. The H-section Girder may be constructed from Angle Girders bolted to Flat Girders.

(549) Useful Push-Button Switch

("Spanner")

A useful miniature switch of the push-button "on-off" type is shown in Fig. 549. It is suitable for use in many different kinds of electrical mechanisms where current has to flow through a circuit for short periods at a time.

The switch consists of a Spring Buffer 1 that is held in the centre hole of a 2½" × 1½" Flanged Plate 2 by two locked nuts. The flanges of the Flanged Plate are extended by two 1½" Flat Girders. When the Spring Buffer is depressed it makes contact with a Bolt 3 secured in the centre hole of a Double Bent Strip 4, which is insulated from the Plate 2, the head of the Bolt being spaced from the Double Bent Strip by three Washers. A length of wire is

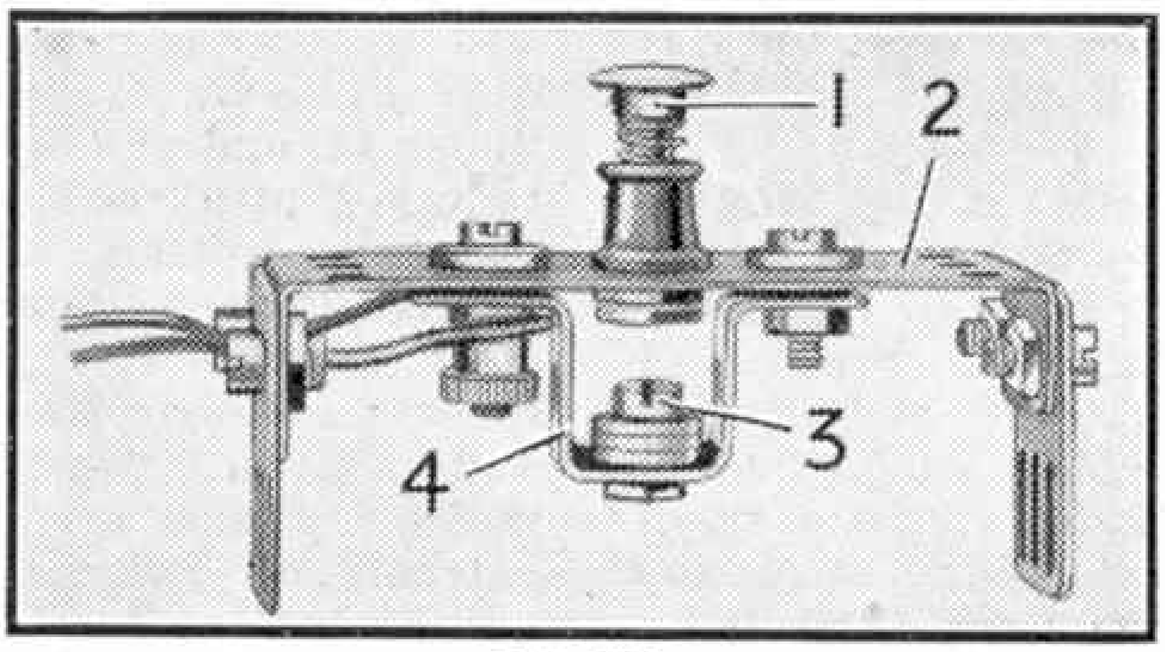


Fig. 549.

attached to one of the 6 B.A. Bolts and another length is attached to the Plate by a Nut and Bolt.

(550) Centrifugal High-Speed Governor

(A. Harrison, Birmingham)

The interesting type of governor shown in Fig. 550 is particularly adaptable for speedometers. It consists of two Couplings 1 forming the weights that are bolted to 1½" Strips. These Strips are pivotally secured at their centre holes to a Collar 2 fixed on the governor shaft 3. The weights normally are held in the position shown by two Springs, which are bolted to them and to Collars 4 mounted on the shaft.

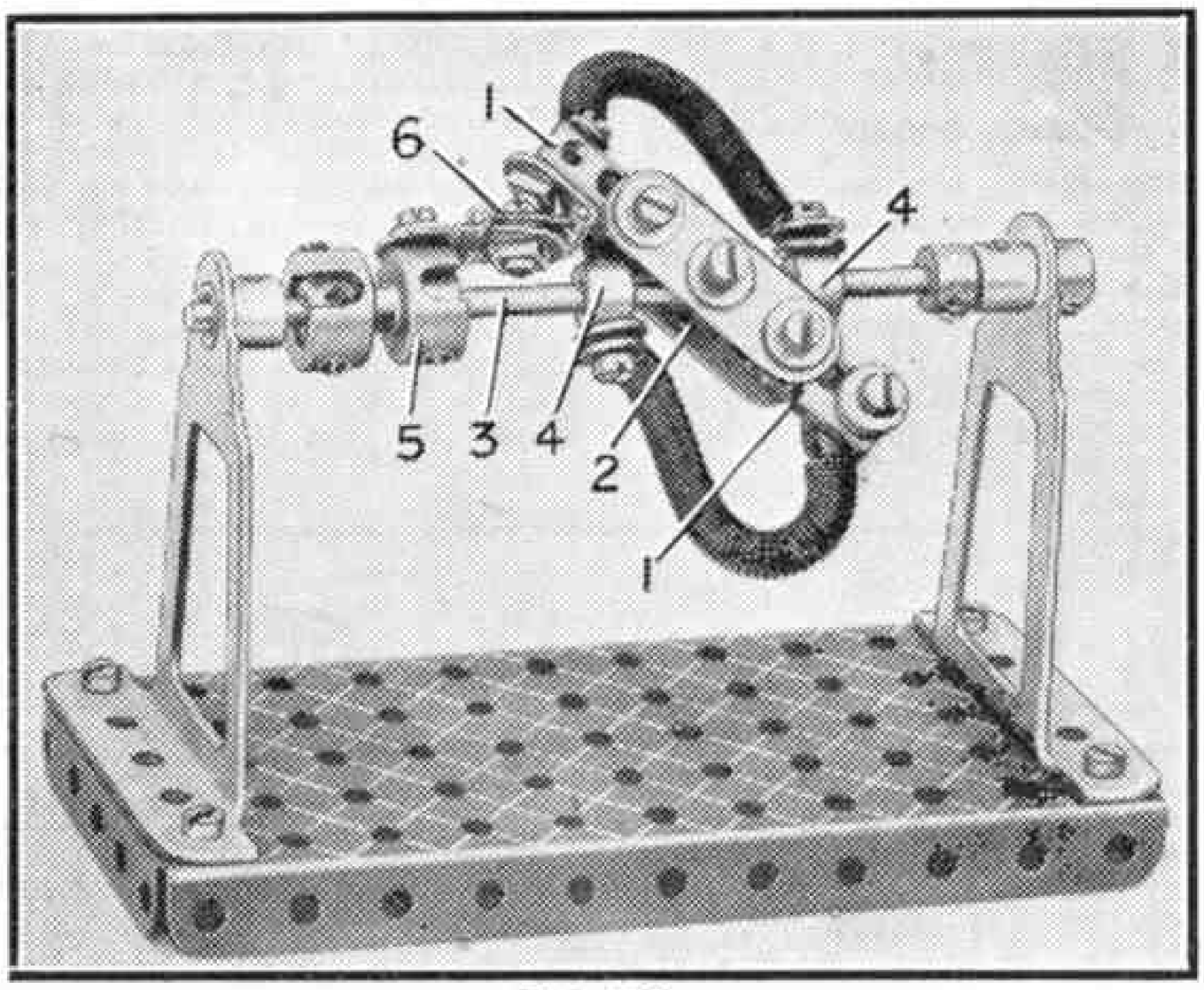


Fig. 550.

When the Rod 3 is rotated, the weights tend to fly outward and then cause the 1½" Strips attached to them to pivot round to a position nearer the vertical. This movement may be communicated to the pointer of a speedometer, or to the control mechanism of the model in which it is incorporated, by means of a Socket Coupling 5 that is free to slide on the Rod 3. Two Collars are gripped in the ends of this Socket Coupling, which is attached also to one end of a hinge unit 6 built up from two Meccano Hinges bolted together. The other end of the hinge is secured to one of the weights.

(551) A Compact Tappet Movement (N. G. Tudor, Birkenhead)

The arrangement shown in Fig. 551 will be found useful in instances where the very rapid longitudinal oscillation of a rod is required. In the example illustrated it is fitted to a model engraving machine, with which it is possible to do remarkably good work.

The mechanism is mounted between the side plates of a E6 Electric Motor. A ½" Pinion on the Motor armature spindle drives a 57-teeth Gear on a secondary shaft that at its opposite end, in the front in our illustration, carries a 1" Sprocket Wheel. Through a short length of Chain this drives a ¾" Sprocket on a Rod fitted between the Motor side plates with a Single Throw Eccentric, the strap extension of which is passed through an Eye Piece 1 pivoted on a Pivot Bolt inserted through one of the side plates. Four Washers are placed on the Pivot Bolt between the Eye Piece and motor side plate.

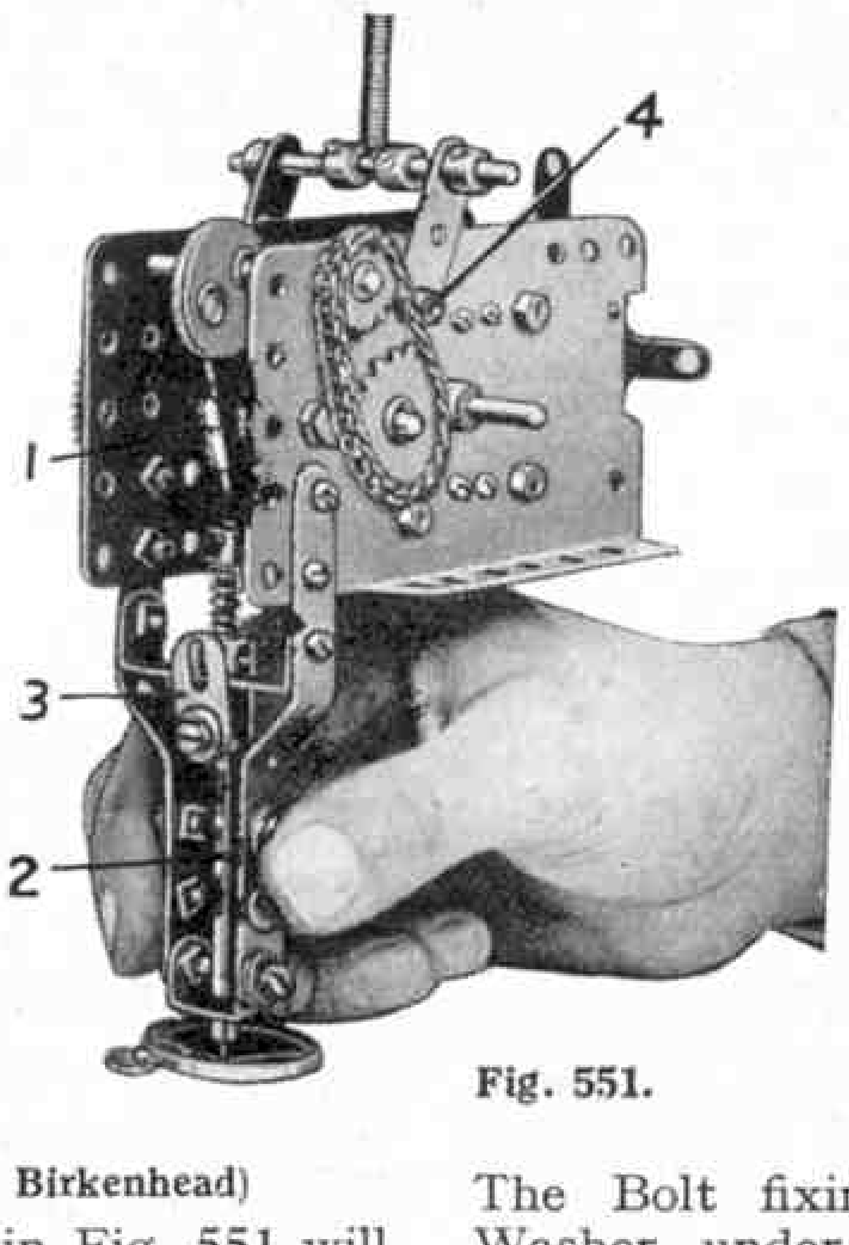


Fig. 551.

As the Eccentric moves up and down it strikes the end of the Axle Rod 2, which is filed to a point to form the engraving tool. This Rod is free to slide in a Double Bracket and 1½" × ½" Double Angle Strip attached to a framework of Strips bolted to the side plates of the Motor. At its upper end the Rod carries a Collar and a Compression Spring, and a second Collar, free to slide on the Rod, is placed below the Spring for spacing purposes.

The Rod is prevented from rotating by means of of a Flat Bracket 3 fixed to a Collar placed below the Double Angle Strip. The Bolt fixing the Bracket carries a Washer under its head, and a second Washer between the Flat Bracket and Collar. A Collar below the Double Angle Strip limits the movement of the Rod.

Club and Branch News

WITH THE SECRETARY

A WEEKLY SWIMMING NIGHT

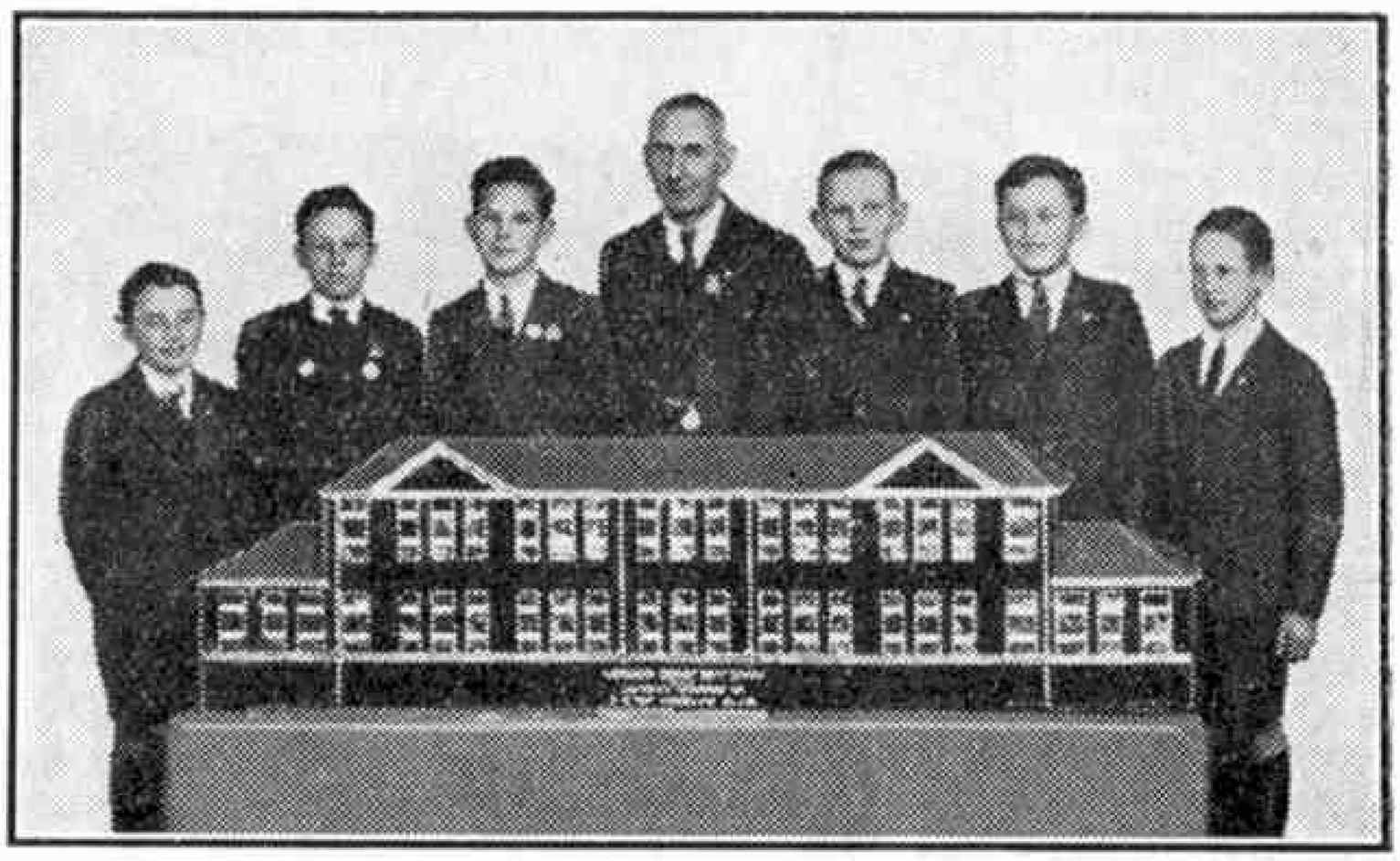
At present no arrangements for summer meetings should be made that involve travelling by train or bus. Rambles of course can be enjoyed, and games such as cricket can be played locally. The long light evenings are with us again, and it should not be difficult to fix up a cricket pitch on which practices can be held on one or two nights a week, while matches can almost certainly be arranged with local teams, including those of other boys' clubs and organisations. Games also can be played between different sections of a Club or Branch.

Another good plan is to take up swimming. A weekly Swimming Night at the local baths would be thoroughly enjoyable. For the swimmers open and handicap races can be arranged, and those who cannot yet swim should be given help and instruction. I should like to think that by the end of the summer every Meccano Club and Branch member will be able to swim, and I know that those who set out to learn will find it really good fun.

A MECCANO MODEL ON TOUR

The magnificent model of a school that is illustrated on this page was built by members of the Exeter M.C. It is a triumph of construction, and its completion alone was an achievement. But that was not the end of it. The model has just returned to the Club after a three month's tour, in which it was displayed at the School represented and in a Hobbies Exhibition.

A model with the special local interest this possesses is admirable for assisting in efforts to raise funds during Warship Weeks and similar efforts. It attracts attention, and most of those who see it, wherever it may be displayed, would be delighted to have the opportunity of placing a small contribution in a box alongside, especially if a well-designed card giving a few details of the model and explaining the purpose of the Fund is placed in front of it.



Members of the Committee of the Exeter M.C., with the fine Meccano model of Ladysmith School, Exeter, built by the Club. From left to right they are R. Moore, J. Casley (President), B. Hackett, Mr. M. C. Hodder (Leader), K. Addicott (Secretary), D. Blatchford and D. Clarke. The model is over 6 ft. long, and has aroused intense interest when shown at Exhibitions in Exeter.

Club Notes

King Street Library (Stretford) M.C.—A convoy, a fair-ground, bridges, motor vehicles, and home articles, such as electric fires, washing machines and sewing machines, have been set as model-building subjects with splendid results. Machine tools, including a lathe and a drill, both worked by motor, anti-aircraft defences and warships also have been constructed. Warships were built during the local Warship Week, and the battleships, corvettes and aircraft carriers constructed were exhibited in the Children's Library. Games Evenings also have been held. Club roll: 15. *Leader:* Miss D. Carline, King Street Library, Stretford, Lancs.

Plymouth M.C.—Members of the Aeroplane Section are busy constructing small solid models of "Spitfires," "Gladiators" and other famous aeroplanes. Steel track is being introduced on the Club's Hornby Train layout. Training in model railway working is given to all members, who must become proficient in operations before they enter the Hornby Railway Section, and take part in operations. The other Sections of the Club continue to be extremely active. Club roll: 198. *Secretary:* M. Allen, 11, Rosedale Avenue, Peverell, Plymouth.

Exeter M.C.—Excellent Meccano models have been constructed, including a corvette and a machine gun. Hornby Train operations also have been carried on intensively, the Club having acquired new Hornby Locomotives and additional Rails. The model of Ladysmith School has returned to the Club after being on exhibition at various places for three months. Special awards are now being given to members for models built individually. Club roll: 150. *Secretary:* B. Hackett, 3, Hanover Close, Heavitree, Exeter.

Branch News

Rocket (Apsley).—This newly incorporated Branch has held several successful meetings, at most of which the Branch track has been laid down and train running operations practised. At another meeting a Debate was held on "*Motor Transport v. Rail Transport.*" Games also have been played. *Secretary:* A. I. Hodsden, 31, Chipperfield Road, Apsley, Herts.

Folkestone.—The Branch is now constructing an interesting table railway, complete with country scenery. Excellent operations are enjoyed with it. A new model of a fishing schooner is being completed and has been tried out in practice. Much additional railway material has been obtained for the table layout and operations are being extended. *Secretary:* E. Saunders, 79, Dover Road, Folkestone, N.7.

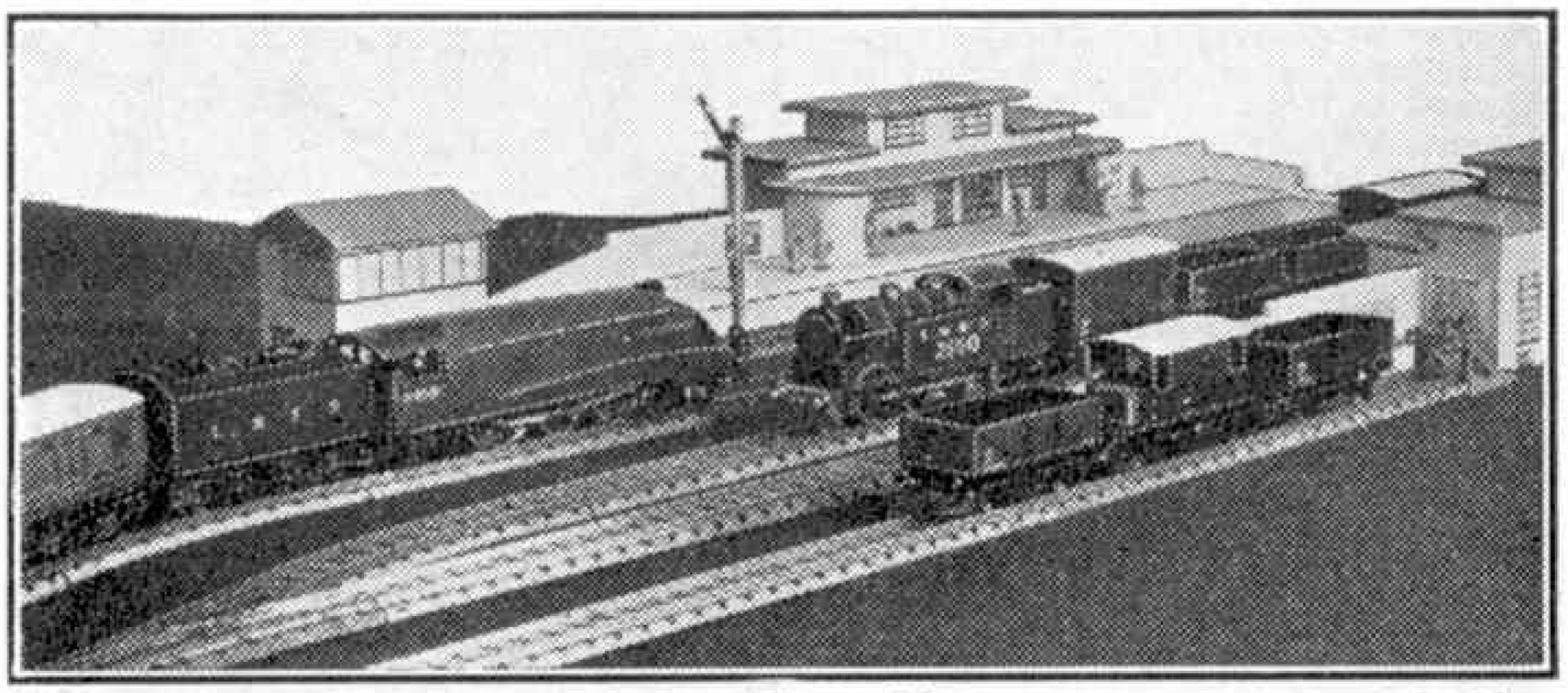
New Mills.—An excellent track covering a space measuring 7 ft. by 5 ft. has been laid down. A good Branch Library also has been formed. A Visit has been paid to a local station, where an interesting locomotive was inspected. *Secretary:* W. Taylor, 85, Spring Bank, New Mills, Via. Stockport.

Fun With Your Dublo Railway

A Useful Yet Simple Layout

IN the article on page 151 of the "*M.M.*" last month we dealt with Hornby-Dublo sidings and loop lines and their various uses. There is one variation of the dead-end type of siding that we did not then describe, however, because in conjunction with the usual continuous oval main line it forms an interesting layout on its own.

The diagram reproduced on this page shows an oval main line and near the centre of the upper straight stretch of this there is a crossover arranged in the usual manner by means of two standard Dublo Left Hand Points. A fairly long siding or "spur" extends from the Points in either direction and each is terminated by means of Dublo Buffer Stops.



Shunting operations in progress in the siding while an express enters the Main Line Station in the background.

The layout is not shown completely signalled but the main line is provided with signals for the movements about to be described. Trains can be run in either direction on the main line as preferred by the operator. We are concerned principally with goods trains, although the movements could be carried out equally well with passenger trains.

Let us see what we can do with the siding if we are running a train round the main oval in a clockwise direction. We have next to the engine a couple of vehicles that we are to detach and leave in the siding. The train approaches the "home" signal shown on the extreme left of the diagram; this could be a Double Arm Signal if preferred, and in that case, as the train has to stop at the next signal, the lower or "distant" arm would be at "caution" and the "home" arm would show "line clear." Whichever type is used it should be placed so that it is at least a train length away from the Junction Signal.

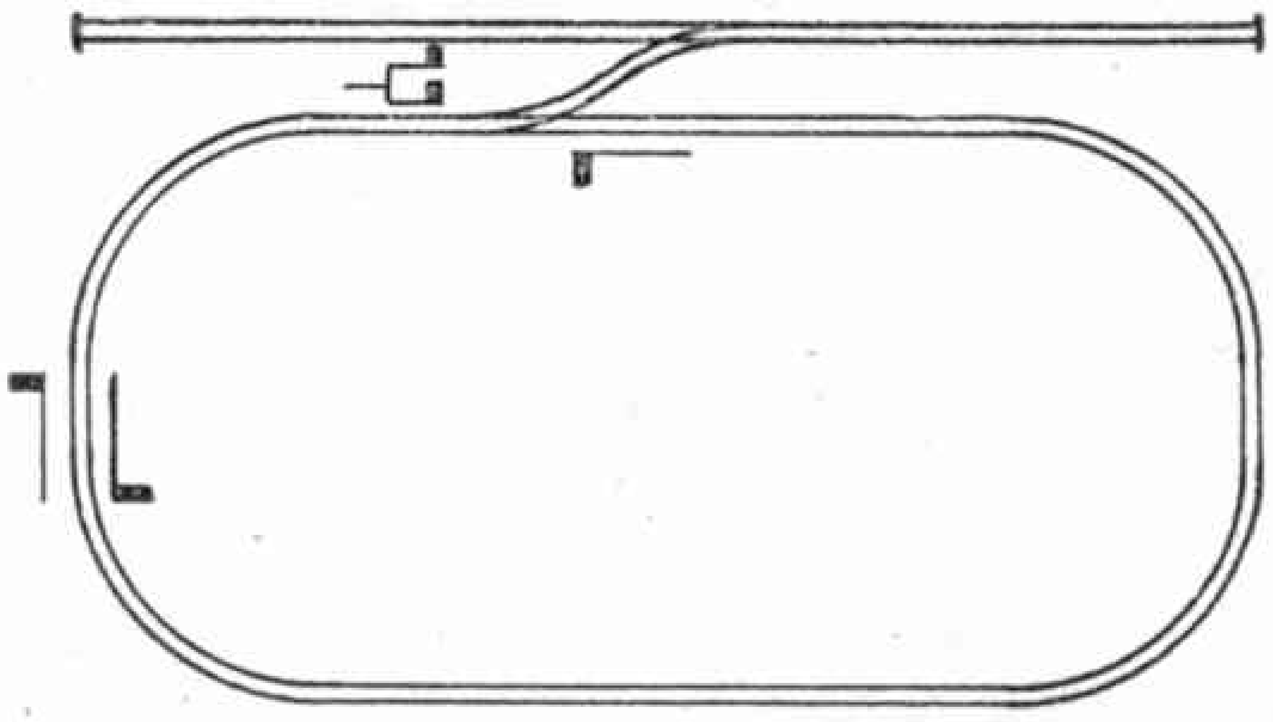


Diagram of the layout referred to in this article.

The Junction Signal controls movements over the Points, and as our train has to stop to uncouple the two wagons to be left at the siding, both arms will be at "danger." The train halts at the Signal therefore, and to protect the train the arm of the Signal in the rear is returned to the "danger" position. When the uncoupling operation has been performed the Points are set for the siding, the arm of the left-hand post or "doll" of the Junction Signal is raised, and the engine moves into the siding. The wagons will have to be left in the left-hand spur of the siding in order to enable the engine to regain the main line. So the Signal Arm is returned to "danger," the Points are drawn forward clear of the Points. The Points are set for the main line again, and the vehicles are pushed over these until the first wagon meets the waiting train. This wagon is coupled up, but the other two are again drawn into the siding as before and shunted into the left-hand spur. Now the engine can return to the train. When it has done so the Points are set straight ahead, the arm of the right-hand "doll" of the Junction Signal is operated, and the train resumes its journey along the main line.

If the train is travelling in an anti-clockwise direction similar operations can be carried out, the right-hand "spur" of the siding then being used. For trains travelling this way, however, there is no direct run available into the siding; backing movements therefore have to be made to push vehicles into the siding. A Point to notice is that the Single arm "Home" Signal near the Points protects them in the trailing direction. We can also have another similar Signal, or a Double Arm Signal, about a train length away in the rear, in order to protect a train standing on the main line. This is not shown in the diagram.

Beyond the Points and round the curve is yet another Signal. Complete trains that require to back into the siding draw up to this; then when the Points have been set, they can shunt in.

The working of the Signals and Points to permit of these movements, together with the movements themselves, will be found really good fun, especially when there are two operators, one acting as "signalman" and the other as "driver."

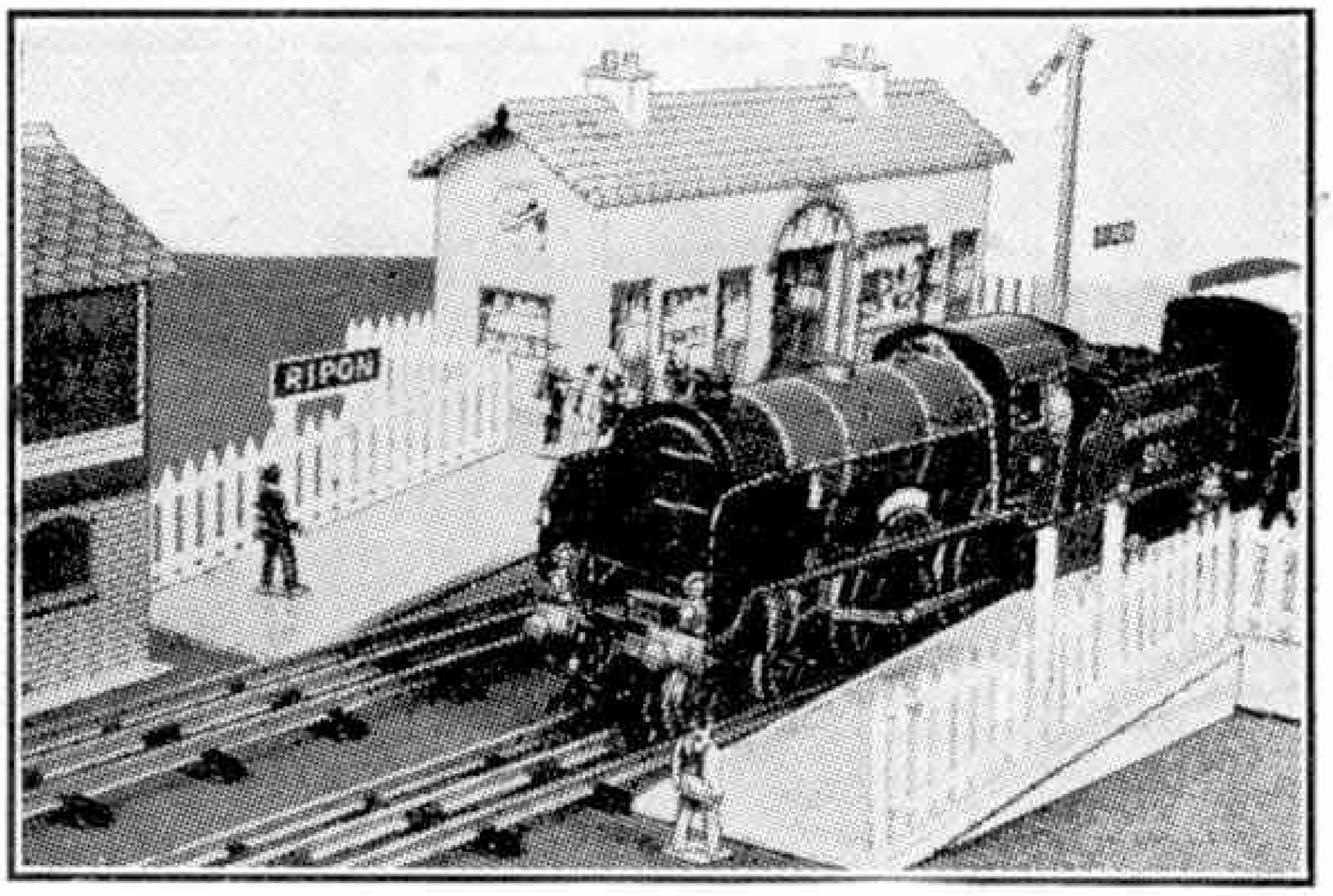
Items of Interest for Gauge 0 Owners

FEATURES of real railway working that are unusual always have a special appeal, and keen miniature railway owners are always on the lookout for interesting items that can be reproduced on their model systems. In this article we give various instances of interesting schemes based on real practice that can be carried out on Hornby railways, and in addition we deal with one or two ideas that are peculiar to model railway working.

Most readers will be familiar with the custom of many model railwaymen of employing a particular type of locomotive or vehicle because it appeals to them. When this is so the layout is usually a freelance one, and the engines and coaches of all four groups may perhaps be found on it. Curiously enough there is at present something of this kind going on on real railways. Shortage of engines or stock on one line may be made up by the use of equipment from other companies. As an instance, S.R. locomotives are working very far afield from their own system on each of the other lines. Those who have an S.R. Hornby Locomotive in addition to other models can then reproduce this feature; and where several boys combine their equipment and a mixture of stock is the result there is now nothing incorrect in using an S.R. engine in conjunction with the stock of other companies. This is the situation represented in the upper illustration on this page, where the well-known Hornby S.R. locomotive "*Eton*" is shown at work on a miniature L.N.E.R. system. In addition to this particular instance imagination can be drawn on to explain all sorts of interesting combinations of miniature locomotives and rolling stock.

Another result of present-day operating conditions is that many trains are composed of several different kinds of coaches instead of all of them being more or less uniform. Corridor and non-corridor vehicles may be sandwiched together in the same train, and an example of this in miniature appears in the upper illustration on the next page. In this the train in the background is composed partly of No. 2 Corridor Coaches and partly of the ordinary No. 2 compartment type vehicles. It is often necessary in miniature to use both type of coaches on the same train, and now real practice provides us with a good excuse for this.

In the same illustration there is a string of locomotives coupled together moving down the line. This method of light engine working is often followed when several engines are required to take trains out of a station within a short space of time. The engines concerned are marshalled together at the shed in the most convenient order, and when they are "given the road" they move off and make their way to the



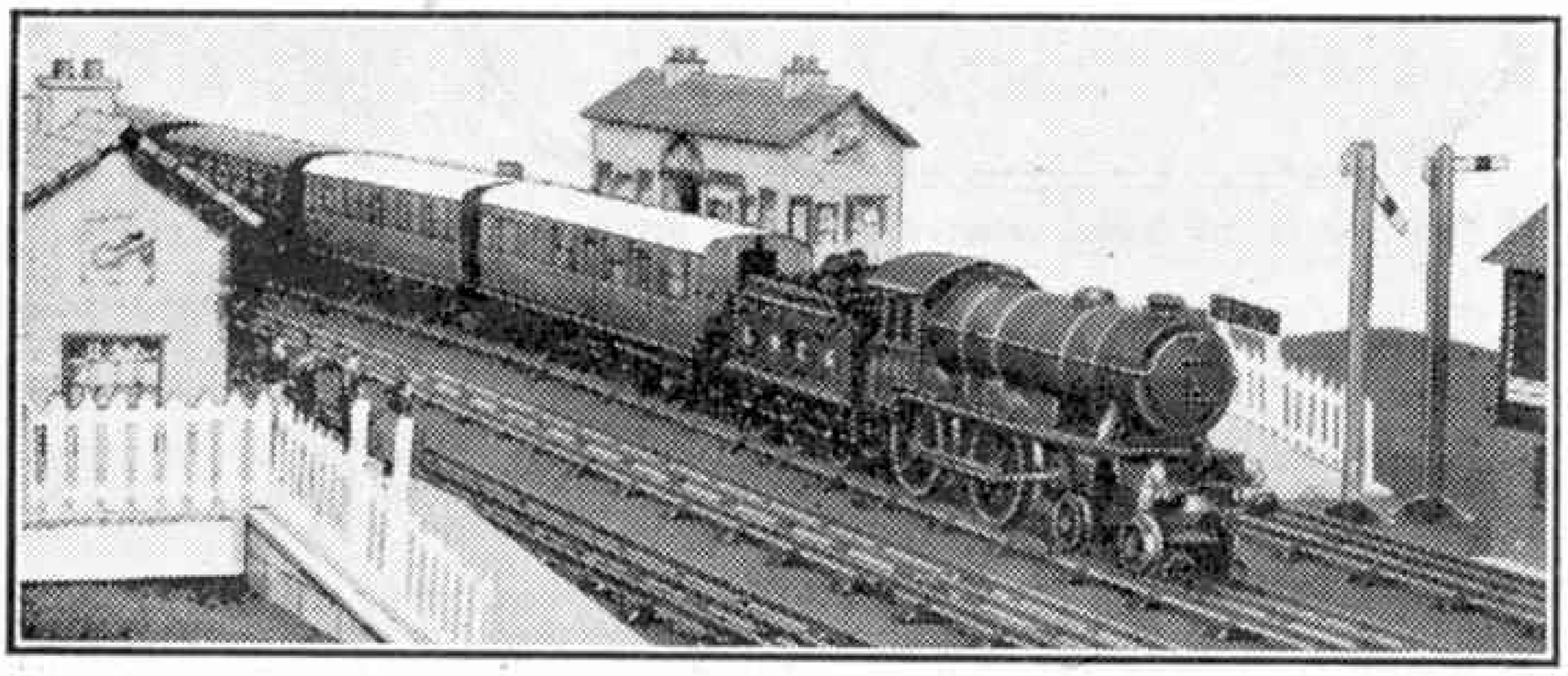
A Hornby S.R. "Eton" Locomotive on an L.N.E.R. system. Locomotives of one company are frequently found on "foreign" lines nowadays.

station. Many curious combinations of different types are to be observed, and this is a feature that appeals to the miniature railway owner, who can usually assemble some varied types from his own collection of engines.

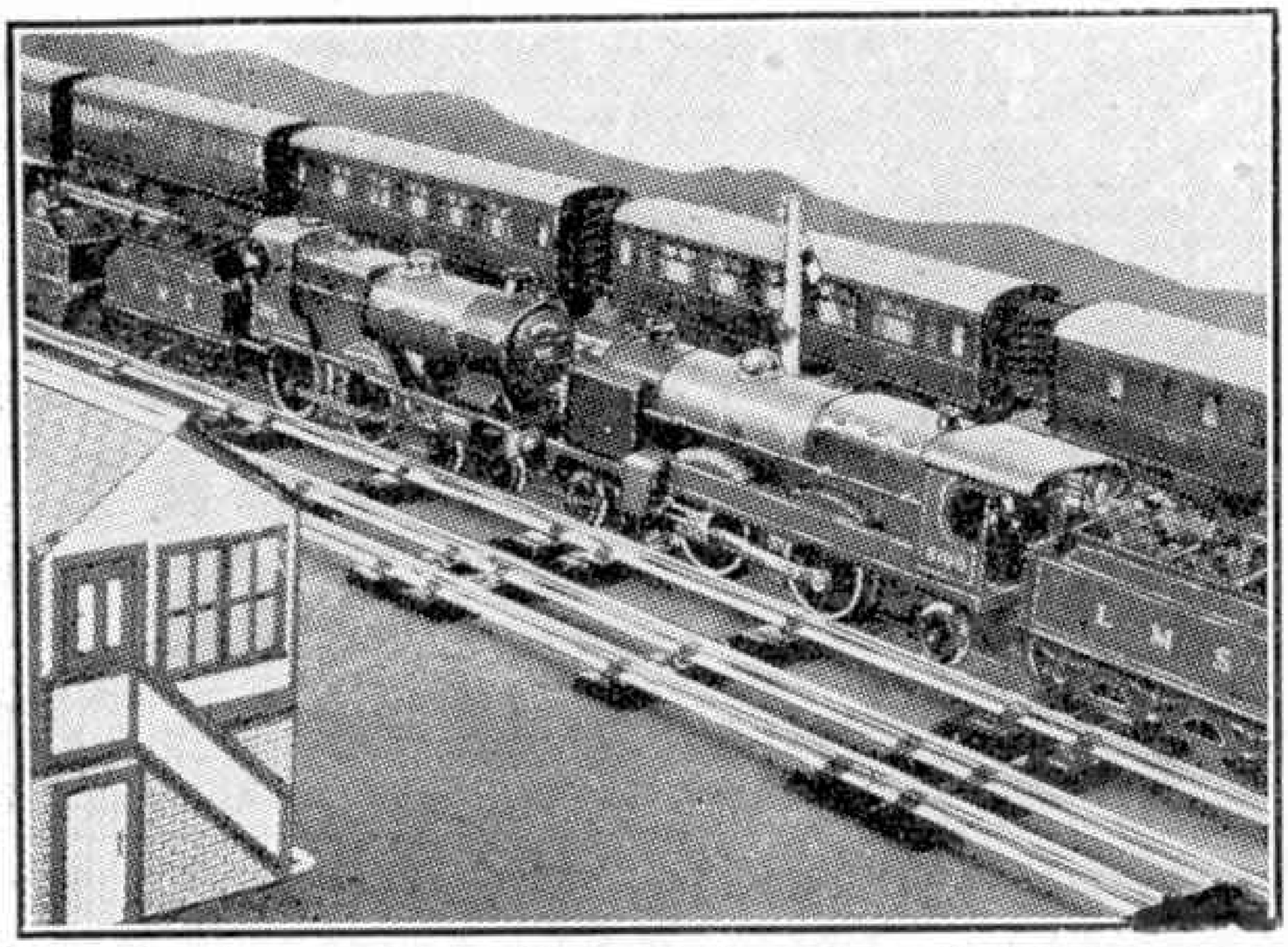
The same practice is followed on some systems when engines are being sent from their sheds for overhaul at the works. The purpose of collecting the engines together in this way into a "train" is to reduce the occupation of the line and also to make fewer signalling movements necessary than if they were sent along separately.

In miniature the scheme is well adapted to clockwork railways, and several engines will travel together quite satisfactorily. Some operators follow the scheme, where No. 2 Special Locomotives are involved or engines having the same type of clockwork mechanism of setting the reversing lever so that the gears are in the "free" position that is peculiar to these motors. The driving wheels will then move independently of the mechanism, which should not be wound up. These "dead" locomotives can then be hauled along by another wound-up engine.

This method can be followed also on railways where both clockwork and electric engines are in use. The clockwork ones can be hauled "dead" by an electric one, provided of course that the clockwork



A station served by the "slow" lines only. An express headed by "The Bramham Moor" is passing on the "fast" lines.



Several engines coupled together on their way from the depot to pick up their trains. In the background is a train of Hornby Corridor and compartment type Coaches.

mechanisms are of the No. 2 Special type. On purely electric railways two engines can be run together provided that the power supply is a double output Meccano Transformer T22M or T6M, but it is not possible to work more than this number together on the same track.

Passing now to layouts, most readers will be familiar with the type of layout arranged so that a train in making a journey from point to point may pass round the system several times, but not necessarily on the same track. A typical station arrangement on this kind of layout is shown in the lower illustration on the previous page. Here there are four tracks, and the general appearance of the scene suggests that the two inner tracks are for fast trains and the two outer tracks for secondary or stopping traffic. Probably in actual fact, according to the exact nature of the layout arrangements, a miniature train would pass through the station first on one of the outer tracks and then on the corresponding inner one on successive runs. Then by means of "return loops" the train would use the other pair of tracks before finishing its run.

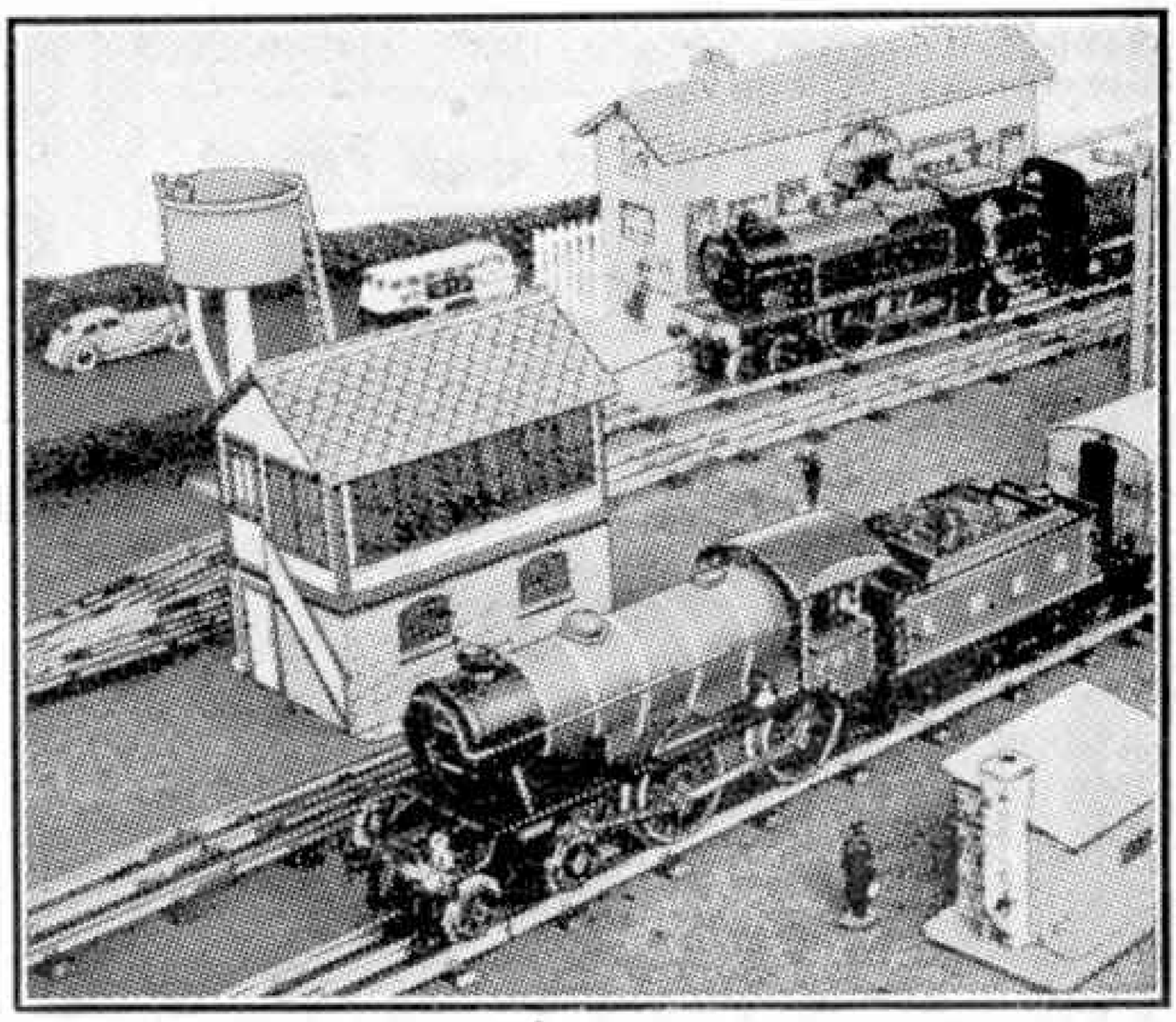
Apart from this more or less special use of this station arrangement, it is quite effective if the two platform roads are "looped" off the main lines just for the length of the station or a little longer. Then fast trains can continue straight through, while stopping trains requiring to make use of the platforms can be directed to the loop roads when necessary. This is a useful scheme, for on a busy line stopping trains can be held in the loop platform roads in order to allow more important traffic to pass. Such "overtaking" can be allowed for in the working arrangements, and the management of operations to follow up the scheme can be quite exciting. Several boys working together can have a great amount of fun in this way.

Another type of layout that allows a good deal of "mileage" to be compressed into a fairly reasonable space is the non-continuous line representing the run from one place to another, such as for instance King's Cross and Leeds. The usual plan is roughly oval in form, but instead of joining up with the starting point the track runs parallel to but outside the terminal length. It continues perhaps for several circuits of the space available until the complete main line resembles a spiral but on the level. The various intermediate stations are placed at convenient points in the correct order for the route chosen and realistic time-table working can be carried out. One or two systems of this kind have been described in the "*M.M.*"

This scheme requires full running round or turning facilities for locomotives at each end of the run, in order to gain the fullest advantage of the plan. Several operators may be required, and this type of layout is usually successful where the equipment belonging to a number of boys is combined to make a good system. Trains can be despatched from either end of the layout by those in charge of the terminals, and those at intermediate stations also play their part.

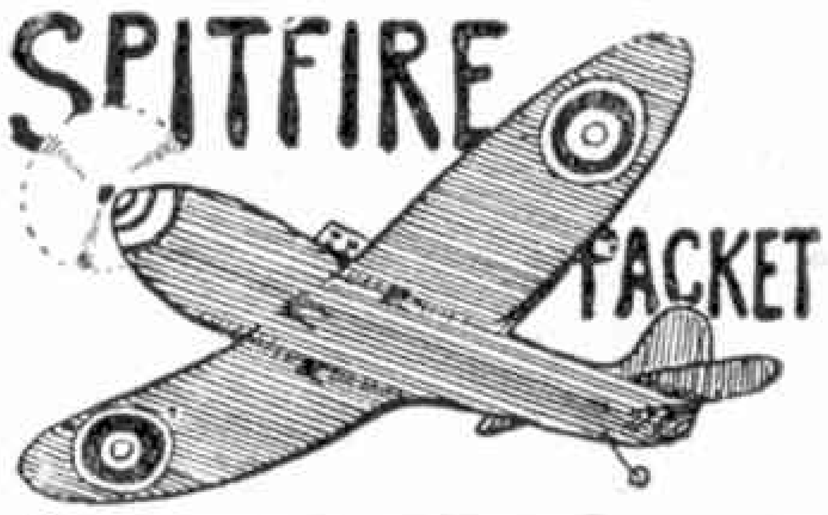
A feature that sometimes strikes the onlooker is that looking across the tracks at one point he may be able to see one station from another that is supposed to be many miles distant along the line. Sometimes this cannot be avoided, but a possible way out of this difficulty is to provide scenic features between successive "ovals" so that the stations are masked from one another, or at least so that the position of one is not extremely obvious from another.

One result of more or less complete terminal facilities may be that the actual length of main line run may be restricted in comparison. This is particularly so where the space involved is not great enough to allow a fair number of successive "circuits." It is possible sometimes to provide a connection between adjacent "layers" of main line so that a continuous track is afforded at one point in the journey, allowing trains to pass round this several times if desired.



Express and stopping trains on a "spiral" layout of the type referred to on this page.

The position of such a connection must be carefully chosen so that if possible a particular station is not passed more than once in the complete journey. This can be done if the number of intermediate stations is not too great, and if the services represented have a good long non-stop run at one stage of the journey.



PACKET contains 38 air, triangular, and stamps with aeroplanes on, etc.—2 LIBERIA triangular (with aeroplane); NIGERIA; MONTENEGRO (unused); URUGUAY; INDIA (Service); 2 JAPAN (obsolete); 2 TANGANYIKA; 3 PALESTINE; 6 BRAZIL (aeroplane design, etc.); 5 U.S.A.; ICELAND (Fish); Australia; NEWFOUNDLAND; MANCHURIA; 2 FRENCH CAMEROONS, MOZAMBIQUE (Airpost); THAILAND; CEYLON (Pictorial); JOHORE; Norway. Price 5½d., postage 2½d. extra. Money back if not satisfied. Applicants for approvals receive 6 Pictorial S. AFRICA and in addition, those sending addresses of stamp collecting friends get an additional set of 4 GEORGIA. **BARGAINS**—100 B. Cols. 1/6; 18 Georgia 10d.; 20 Rhodesia 1/2. ASK for FREE LISTS.
H. C. WATKINS, Stamp Importer (M.M. Dept.), Granville Road, BARNET

FOR SERIOUS COLLECTORS

Our Bargain "Discount" Approvals contain a fine range of picked Modern and New Issues, Pictorials and Commemoratives, etc., from 1d.–6d. each, less a generous discount. (General selections only. No single countries or G.B.). Approvals or details are post free, and we do NOT send again unless requested. State whether you want British Colonials, Foreign or both.

Postal Business Only

THE BIRKDALE STAMP CO. (P.T.S.)
Dept. M, 104, Liverpool Road, Southport, Lancs.

EQUATORIAL AFRICA
FREE FRENCH PACKET FREE!

The latest "De Gaulle" Colony to issue stamps is included amongst this splendid free selection of 15 different stamps. There are Queen Wilhelmina stamps from Holland, a large Belgium Railway issue, an old G.B. King Edward VII, an imperforate Argentine, President Masaryk of Bohemia, French, British Colonies, Eire, old Canada, modern Australia, overprinted stamps, and finally Czarist Russia. This packet cannot possibly be repeated owing to excessive cost and scarcity, so send immediately 3d. for postage and request approvals.

LISBURN & TOWNSEND LTD. (MM), LIVERPOOL 3

FREE! Grand 'Iceland' Packet

of 12 fine stamps including obsolete **NEW CALEDONIA** (quaint **KAGU BIRD**), Russia (our Ally), Portugal (Ceres), **REPUBLIC OF SAN MARINO** (large unused stamp), G.B. (scarce **LION** issue), large **PICTORIAL EIRE** (Dublin P.O. Commemorative), a beautiful large **UNUSED BRITISH COLONIAL** (King George VI), etc., etc., and lastly, as my special May gift, I am again presenting the beautiful and popular **ICELAND** stamp (swimming **Codfish**), illustrated in my last month's advertisement.

This fine collection will be sent **ABSOLUTELY FREE** to all collectors sending 3d. to cover postage and asking to see my special **"MERCURY"** Approvals.

PHILIP J. DYKE
35, Buckleigh Avenue, Merton Park, S.W.20

DE GAULLE 1942

Cameroun is the first of the Free French Colonies to issue an entirely new set of stamps, which has been printed in England and has the words 'France Libre' prominently displayed. I offer three of this historic issue entirely free to all applicants for approvals enclosing 2½d. postage.

R. D. HARRISON, ROYDON, WARE

COUNTRIES MENACED BY "THE YELLOW PERIL"

8 FREE stamps from Australia, New Zealand and India to all applicants for our World Famous Approval Sheets sending 3d. to cover cost of postage.

Dept. 374, ERRINGTON & MARTIN
South Hackney, London E.9. Est. 1880

FREE 10 NEW ISSUES AND NOVELTIES

including Czecho-Slovakia (Pres. Masaryk), **Dutch Indies** (Queen Wilhelmina), **Hong Kong Centenary**, **Iceland** (**Codfish**) Japan (Pictorial), **Morocco** (Mint K.E. VIII), **Poland** (Pictorial), **Turkey** (Column of Constantine) etc. I will send this gift **absolutely free** to all stamp collectors sending 2½d. postage.

G. P. KEEF
Willingdon, Eastbourne

MINT CORONATION SETS—BUY WHILE AVAILABLE

S. Africa 3/6; S. W. Africa 5/6; S. Rhodesia 3/2; Papua 1/3; N. Guinea 2/9; Nauru 1/11; Malta, Niue, N. Zealand, Cooks, Gibraltar, 1/-; Ceylon, Antigua, Bahamas, Barbados, Bermuda, Solomons, Caymans, Cyprus, Dominica, Gambia, Gilberts, Grenada, Jamaica, Leewards, Montserrat, Turks, Nigeria, St. Kitts, St. Lucia, St. Vincent, Virgins, 9d.; Falklands, Nyasaland, 8d.; Morocco, 5d. ALL OTHERS IN STOCK. Stamped addressed envelope please.

C. A. RUSH, 38, Queen's Avenue, Whetstone, N.20

For other Stamp Advertisements see pages 192 and vi.

Stamp Collecting

A "Shakespeare" Collection

By T. J. Edwards

MANY "*M.M.*" stamp articles have shown how stamps may be linked with almost every other interest a boy may have. Thus the reader who is keen on railway topics can make a pictorial record of the development of the locomotive. Similarly one who is interested in birds, animals, aeroplanes or sport can make a fascinating stamp collection devoted to designs associated with his hobby. Some of the world's greatest collections have begun in this manner.

One of the most valuable subject collections ever formed, and probably the most extensive devoted to one subject, fills 10 volumes and is made up of stamps to which apt quotations from Shakespeare have been attached. It is to be sold in the United States for $1,400 and is so outstanding that I think readers will be interested to know something about it, possibly as a guide and incentive to seek to make something big for themselves. The collection is the product of many years' work and it would be possible for any sufficiently keen young collector to build a similar collection, not necessarily of Shakespearian quotations, but in connection with any subject that has a strong appeal to him.

Perhaps the most suitable example to open this brief description is the 5c. from Switzerland's 1916 Pro Juventute issue. To this is added the well-known quotation: "*The whining schoolboy, with his satchel and shining morning face, creeping like snail unwillingly to school,*" from "*As You Like It,*" Act II, Scene 7.

"That fellow handles his bow like a crow-keeper."

The Swiss 3c of 1908-9 showing William Tell's son, is used to introduce the quotation "*That fellow handles his bow like a crow-keeper,*" from "*King Lear,*" Act IV, Scene 6, and from "*Romeo and Juliet,*" Act III, Scene 3, comes "*Thou cut'st my head off*" for the Tanganyika 15c. of 1922. Both stamps are illustrated here. Other examples from the stamps of Siam, Tonga and Salvador are illustrated on page 193. The name of the monarch whose portrait appears on the Siamese stamp is Phra Paramendr Maha Chulalongkorn, and the Tonga stamp illustrates a bread-fruit tree.

An interesting set of quotations is fitted to the St. Kitts 1905-19 issue, various values from which bear a design showing Columbus discovering the island with the aid of a telescope, although telescopes were not known in his day! By the way, the stamp designer is not responsible for this "howler," which is based on the island's coat of arms; he was merely following instructions when he adopted it. These stamps are accompanied by four quotations, the two most interesting being: "*Am come abroad to see the world*" from "*The Taming of the Shrew,*" Act I, Scene 2, and "*A vision of the island*" from "*The Tempest,*" Act V, Scene 1.

"Thou cut'st my head off."

The author of this collection has a delightful sense of humour and many of the quotations make very funny reading when seen with their illustrations. The St. Vincent 1885 1d. stamp was surcharged "2½ *Pence,*" and later the same stamps were made to do duty as 1d. values by obliterating the surcharge and adding another in the form of a very bold "1d." The second surcharge fell into position right across the Queen's portrait, and two appropriate quotations appear: "*Throw a figure in her face and so disfigure her with it,*" from "*The Taming of the Shrew,*" Act 1, Scene 2, and "*Made it one upon my cheek,*" from "*The Comedy of Errors,*" Act I, Scene 2.

"The rest o' the fleet."

Almost the next page bears a gentle tilt at two rather pompous issues from Salvador. These are the 1897 issue, the designs for which bore in gold letters the inscription "*Greater Republic of Central America,*" and the 1900 issue. The latter consisted of stamps prepared for issue in 1898 to follow up the 1897 issue, but did not appear until 1899; it was re-issued in 1900 with the new date overprinted boldly across the design. The 1897 issue carries the quotation "*In glittering golden characters express a general praise,*" from "*Pericles Prince of Tyre,*" Act IV, Scene 3, while the 1900 issue is annotated "*An expir'd date, cancell'd ere well begun,*" from "*Lucrece.*"

We note specially an amusing comment on Poland's 1930 Revolution Centenary issue, which showed soldiers of 1830 marching with bayonets fixed and at the ready. The added quotation is from Part I of "*King Henry IV,*" Act IV, Scene 1, and reads "*Not a soldier of this season's stamp.*"

At the time of the plague in 1852, letters from the Roman States were specially cancelled with heavy black crosses to show that the letters had been disinfected. Several specimens are shown in the collection with the quotation "*O, plague right well prevented,*" from "*Much Ado About Nothing,*" Act III, Scene 2.

The collection includes a very clever range of comments on the United States 1892 series, commemorating the discovery of America by Christopher Columbus. The 1c., illustrated here is noted "*Arrived at the last unto the wished-for haven,*" from "*The Taming of the Shrew,*" Act V, Scene I. America was actually not the "wished haven," for Columbus had set out to find a western passage to China. The stamp is intended to depict the scene when Columbus had just sighted land, however, and he did not know then that this was a new world before his eyes.

"Arrived at the last unto the wished-for haven."

The 3c. stamp shows Columbus' flagship with the quotation "*There lies your way, due west,*" from "*Twelfth Night,*" Act III, Scene 1, (*Continued on page 194*)

A FEW ATTRACTIVE BARGAINS

Coronations complete 202 val., mint 55/-, used 65/-. Crown Col., 135 val., mint 27/6, used 32/6. Dominions, mint 29/6, used 35/-. Coronations & Jubilees, single sets ask for special list. Gt. Britain K.G.VI 2/6, 5/-, 10/— fine copies 4/6. Morocco Edward VIII 11 val. mint 1/3. Kenya Prov. mint 3 val. in pairs 1/9 set. N. Borneo 1939 to 25c. 11 val. mint 4/3. Aden K.G.VI to 8a. mint 2/11. Gilberts K.G.VI to 3d. mint 2/6. New Zealand Prov. used 2 val. 5d. set. 100 diff. Pictorials Whole World 5/-.

Postage extra on all orders under £1. Cash with order.

Want lists solicited for British Colonials and Foreign Countries.

A. LANG LTD., 9, CHARLES II STREET, ST. JAMES'S, LONDON S.W.1

BLITZ STAMP FREE

The **WINDSOR STAMP CO.** offer **YOU, ABSOLUTELY FREE,** a marvellous packet which includes an attractive stamp just issued by the **Polish Government in Britain** showing the ruins of U.S.A. Embassy in Warsaw (the famous Raczynski Palace) after Air Raids at beginning of War. **YOUR** Collection must include one of these Historic War Stamps. The **WINDSOR STAMP CO.** will also send you as well, many other fine stamps **ABSOLUTELY FREE** in this wonderful packet, including pictorial **NIGERIA; ECUADOR** (Compulsory Tax Stamps); **PERAK** (Malaya State now in **JAPANESE** occupation); Special **SCHLESWIG** Plebiscite issue; pictorial **ESTONIA** (View of Reval, near Russian front); large **AUSTRALIA** Zoological pictorial and attractive large **SILVER JUBILEE 1910-1935** of King George V. Just send 3d. stamps to cover posting costs and get the whole of this admirable collection **absolutely free** with Approvals.

Windsor Stamp Co. (Dept. M), Uckfield, Sussex

THE FIRST STAMP EVER ISSUED

(British 1840 Penny Black) for P.O. 4/6! It is guaranteed genuine in every respect. (Better-grade copies also available at 5/9, 7/6 & 10/- respectively). Other "Classics" which every collector should have are the **Cape of Good Hope Triangulars**; we offer 1d. rose (cat. 40/-) at 15/-; 1d. brown-red (cat. 52/6) at 17/6; 4d. blue (cat. 15/-) at 6/-; and 6d. pale lilac (cat. 40/-) at 15/-. Superb approvals (any country) against approved English references or deposit. **Full Lists Free.**

NORRIS & CO. (Dept. M), SOMERCOTES, DERBY

STAMPS AT WAR DISCOUNTS

COLONIALS, FOREIGN or AIR MAILS.
Pick any from our celebrated APPROVALS.
20/- worth as priced for **5/-**, and *pro rata*.
OLD AND RARE STAMPS BOUGHT.

SAUNDERS & CO., 51, Draycott Avenue, HARROW

FREE SET OF PERAK — MALAYA — FREE

To all applicants requesting approvals a short set of G.V. Perak, Malaya stamps will be sent absolutely free. Don't delay, send at once and secure these valuable also interesting stamps. Liberal discount on purchases off the approvals.

Martin Courtney (Dept. M.M.), 36, Albert Street, Warwick

FREE GIFT to all applicants for approvals. Gosling, c/o G.P.O., Post Restante, Dumfries, Scotland.

STAMPS WANTED

We require collections, loose lots, good duplicates, etc. Modern issues preferred, Br. Cols. or Foreign. Packet and "Free Gift" type stamps not wanted. Please send full details only in first instance, and state price required, as we do not make offers. Prompt attention given to all letters, and prompt cash settlement. (No exchanges).

THE BIRKDALE STAMP CO.
104, LIVERPOOL ROAD, SOUTHPORT, LANCS.

VALUE and VARIETY APPROVALS ½d. to 1/- each.
12-page Book. FOREIGN and COLONIALS.
E. & N. GREY Dept. M, 9, Rosemary Ave. HOUNSLOW

Catalogued 10d., 2/6, 6/-—penny each! Approval, 3d. postage please. J. Baguley, Weston Colville, Cambs.

FREE! FLOWN AIR MAIL COVER FREE!
One of these beautiful covers complete with 3 to 6 stamps will be sent FREE to all applicants who send 2½d. for postage and ask to see a selection of my "WORTH WHILE" approval sheets.
JOS. H. GAZE, 10, Pimlico Road, CLITHEROE, Lancs.

INDIA

Gibbons' SIMPLIFIED Catalogue No. 3
Unused Marked with *

1d. each, 9, 10, 24, 26, 28, *36, 36, 38, 39, 48 to 52, 65 to 71, 75, 76, 79 to 83, 85, 87, 93, *94, 107 to 110, 111A, 121 to 124, 126 to 131, O19 to O23, O28 to O32, O34, O35, O43 to O50, O52, O70 to O78, *O83, *O84, O84, O86.
2d. each, *24, 29, 30, 40, *48, *49, *50, 53, 54, *65, *66, 72, 74, 78, 86, *93, 112, 113, 116, 117, 125, 132, 133, 135, 2A (1941), 4A (1941), O14, O25, O54, O60, O67, *O85, *O86, *O87.
3d. each, 18, 41, 84, 103, 114, 115, 3½A (1941), 6A (1941), O6, *O18, O24, O26, *O29, O33, O36, O37, O53, *O66, *O67, *O71, *O72, *O73, *O74, *O82, *O87, O89.
4d. each, 56, 88, 102, 111, 136, 8A (1941), O4, O27, O51, O69, *O88.
6d. each, 12, 19, 32, 35, 58, *87 (no gum), 95, 97, *O48A, O55, *O69, O80, *O89.
9d. each, 13, *25, *27, *41, *78, 96, 98, 118, O38.
1/- each. 33, 34, *88 (no gum), 89.
1/6 each, *9, 15, 104, 119. **4/- each,** 138.
2/- each, *42, O39. **5/- each,** 5.
2/6 each, *89 (no gum). **6/- each,** O40.
3/- each, 90, O17, O61. **7/6 each,** 62.
3/6 each, *17, *O63. **10/- each,** 6, 7, 63, O41, O57.

Mint Blocks or Pairs of following numbers are in stock: 27, 36, O18, O66, O67, O69, O73, O82, O83, O84, O85, O87, O88, O89.

India Packets. All face different. 50 for **2/6**; 100 for **5/-**; 125 for **10/-**; 145 for **20/-**; 175 for **£2.**

Postage please. Any of above stamps on approval against cash. Ask for complete lists.

FRED HARLOW, B.P.A.
133, BRADBOURNE VALE, SEVENOAKS, KENT
Phone: Sevenoaks 742. *Bankers:* Barclay's Ltd.

For other Stamp Advertisements see pages 190 and vi.

Stamp Gossip

and Notes on New Issues

Swiss Economy Issue

A new Swiss issue is an interesting pointer to the difficulties that confront the remaining neutral countries on the Continent. It consists of a 10c. stamp printed in German, Italian and French to cover the three languages commonly spoken in the various Cantons. The wording reads "*Hold Firm—Save all Waste Materials.*" The object is to encourage salvage so as to reduce the buying of raw materials from outside Switzerland.

The stamp as issued measures 1⅝ in. by 1 in., and is singularly unattractive in design. The lettering is white on a drab brown background, with the bottom corner shields red on white and white on red respectively. The rectangular panels at the top are printed brown on blue. The three forms of the issue are illustrated at the foot of the page.

"The devil himself hath not such a name" ("Merry Wives of Windsor" Act II, Sc. 2).

Australian Provisionals

Wartime changes in postal rates have resulted in the surcharging of Australia's 2d., 3d. and 5d. issues to increase their values, each by halfpenny. The method of surcharging the first two gives them more than usual interest. The 2d. value in the former has been blotted out by a great black circle covering the whole of the King's shoulder, and the new value has been super-imposed on the circle.

Similar treatment has been given to the 3d. stamp, but in this case the value appears on both sides of the portrait. The left hand figures have been blotted out by four cancelling bars, and the right hand side by a great black square on which the new value is shown in gold figures. The 5d. stamp has received orthodox treatment, the left hand figures being cancelled by five horizontal bars and the right hand side showing the new value, 5½d., surcharged over the existing 5d.

Forthcoming Articles

In our next issue, we shall deal with further aspects of wartime topical stamp collecting, based on the many interesting pictorial stamps that show towns and cities in the recent war news. Later we shall describe and illustrate stamps bearing portraits of leading figures in the United Nations.

* * * *

Three postage and three air mail stamps showing scenes in Mexico were issued on 14th February to commemorate the founding of Guadalajara, the second city of Mexico.

We thank Messrs. H. R. Harmer, 131-137, New Bond Street, London W.1, for their courtesy in loaning the stamps from which the illustrations for these pages have been made.

A Great Britain Colour Change

Shortage of the special brown pigment used in printing the current 2/6 stamp has led to the re-issue of this stamp in a bright green colour. This change was made very unexpectedly and without the publicity that has been given to the colour changes in the low values.

The change differs in another way from the earlier alterations, all of which were to a lighter shade, in that it was made for the sake of economy in dyestuffs and not because of a definite shortage. The demand for this stamp has increased very largely in recent months, due to its popular use for telegrams sent across the Atlantic by Canadian and American troops stationed in the British Isles, and also for entry forms in Red Cross Radio Competitions.

"A tree whose boughs did bend with fruit" ("Cymbeline" Act III, Sc. 3).

The Best War Stamp

South Africa's 1½d. War Effort stamp is likely to prove one of the most popular of all British war stamps. The design shows a portrait of Wing-Commander H. C. Kershaw, the first South African airman to be awarded the Distinguished Service Order in the present war.

Wing-Commander Kershaw gained this coveted award in the course of the campaign against the Italians in Abyssinia. He was then a Flight Lieutenant. His Squadron Leader had been shot down over the aerodrome at Diredawa. Kershaw dived down after him, grounded his machine only a few yards away, lifted out the wounded pilot, carried him to his own machine and made good his escape through a tremendous barrage of anti-aircraft fire.

"Are those stars or suns upon it?" ("King Henry V" Act III, Sc. 6).

The stamp portrait is based on an oil-painting by the famous South African artist, Neville Lewis, and the design also shows two Hurricane fighters climbing.

The Waste Paper Drive

From a news cutting we learn that recently 10 tons of the tiny pieces of paper punched out by a stamp perforating machine have been sent to be repulped.

We cannot even venture to estimate the number of stamps that were perforated to produce this volume of waste. Indeed, it must be so astronomical a figure as to seem improbable. The cutting did not disclose any details other than those given above.

The new Swiss stamp with inscriptions in three languages, referred to on this page. The slogan exhorts the Swiss to save raw materials of all kinds.

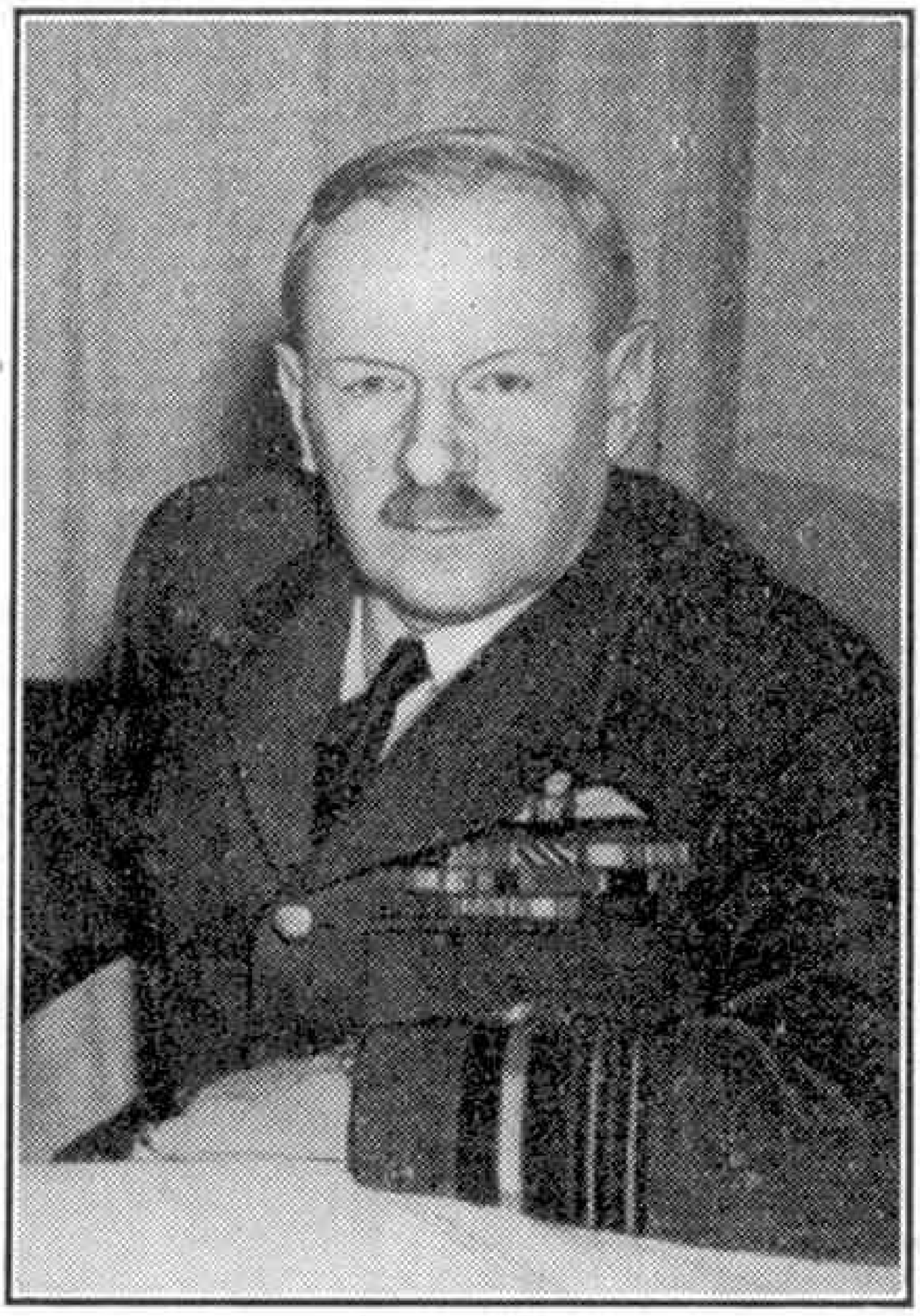
Leaders in the War

Air Marshal A. T. Harris

Air Marshal Arthur Travers Harris was born in 1892. He joined the 1st Rhodesian Regiment as a bugler in 1914, and served in Gen. Botha's campaigns in South and South-West Africa. In 1915 he transferred to the Royal Flying Corps, and served in France as a flying officer. He was awarded the Air Force Cross, and in 1919 was granted a permanent commission as a Squadron Leader in the Royal Air Force.

He served in Iraq from 1922 until 1924. After staff training in England he was sent abroad again in 1930, as Air Staff Officer, Middle East, and in 1932 became Senior Air Force Officer, R.A.F. East African Flight. In 1934 he was appointed Deputy Director of Operations and Intelligence at the Air Ministry, a position he held until 1937 when he attained the rank of Air Commodore and was given command of No. 4 Bomber Group. He was a member of the Air Ministry Commission that went to the United States and Canada in 1938 to begin the arrangements for the purchase and production there of aircraft for the R.A.F. In July 1939 he was promoted to Air Vice-Marshal.

Early this year Air Marshal Harris was given his present appointment as Air Officer Commanding - in - Chief, Bomber Command, R.A.F.



Air Marshal Arthur Travers Harris, C.B., O.B.E., A.F.C., Air Officer Commanding-in-Chief, Bomber Command, R.A.F.

Famous Inventors: Thomas Alva Edison—

(*Continued from page 177*)

and the system was ultimately adopted.

During this period Edison brought about numerous improvements in duplex telegraphy, the sending of two messages over the same wire at the same time, but in opposite directions; in diplex telegraphy, the sending of two messages at once over one wire in the same direction; and in quadruplex telegraphy, in which two messages could be sent simultaneously from each end of the line. *(To be continued)*

An Island Bird Sanctuary—

(*Continued from page 164*)

mates, their black backs and dazzling white fronts giving them an extremely clean and well-kept appearance. Their tameness, together with their inquisitive antics, can provide solid entertainment for hours to anyone even only mildly interested in birds.

The precipitous parts of the cliff not only house the most birds, but also that select band of outlaws, the raven, peregrine and buzzard. On all the small ledges from high tide mark to the cliff top the swaying necks of guillemots and the whitened nests of kittiwakes may be seen. The guillemots are content with very small bare ledges just capable of holding their single egg, as shown on this month's cover illustration, and the kittiwake will even cement its nest to what often appears a vertical wall. The sitting birds too are often drenched in spray, and through these exposed positions the loss of eggs and chicks is high. The pleasure and wonder from feasting one's eyes on so many birds in so compact an area lasts a long time.

To the vast numbers of sea birds the island sanctuary is just a summer home, but to the raven and the peregrine it is their lifelong castle. These two birds, together with the buzzard, nest in very inaccessible parts of the cliff, but they may often be seen in their characteristic flights, or perched on some pinnacle of rock. It is to such island sanctuaries that these birds owe their continued existence, as on the mainland they are ceaselessly harried. Although the peregrine and buzzard scare the whole of the island population, the actual number of birds they kill for food is negligible compared with those slaughtered by the dozens of greater black-backed gulls.

Stamp Collecting—(*Continued from page 191*)

while "*The rest o' the fleet,*" from "*The Tempest,*" Act I, Scene 2, accompanies the 4c. value, depicted on page 191. It will be remembered that Columbus had a hard struggle to secure funds for his great voyage. The scene when Columbus pleaded with Queen Isabella for support is shown on the 5c. and the quotation is "*I do beseech your Grace, for charity,*" from "*King Henry VIII,*" Act II, Scene 1.

On the 15c. and 30c. values the stamps show Columbus reciting the tale of his adventures and they are noted respectively "*Now he begins the story,*" from "*Othello,*" Act IV, Scene 1, and "*This is the strangest tale that e'er I heard,*" from "*King Henry IV,*" Part I, Act V, Scene 4.

These few quotations from a most extraordinary collection are more than enough to show the wide possibilities of a "quotation" collection. Not the least attractive feature is that such a collection would have a fascination for any non-collector, and the true test of interest is its power to command attention from those who have no knowledge of stamps.

Competitions! Open To All Readers

Find These Missing Words

Can you choose the right word to express a simple idea or to describe a well-known aeroplane? If so you will enjoy our main competition this month. In the panel in the centre of the page is a short passage from which 21 words and numbers have been removed, the places they should have occupied being indicated by dashes. Below the passage is a list of them, and all that you have to do is to replace each correctly.

The words and numbers taken out are given in alphabetical order. Every one must be used, but each can be inserted only as often as it appears in the list. For instance, the word "Fortress" can only be inserted once, but the word "fighter" appears twice in the list and therefore must be used twice in completing the passage.

To-day there are — aircraft in service or — capable of a speed of — m.p.h., and bombers such as the Boeing "Flying —" which can fly upon their — errands at — m.p.h. These — have been made possible in part by the greatly increased power of the modern aero —. For example, the new Napier "Sabre" — cooled engine fitted in the — "Typhoon" — develops the — power of 2,350 h.p. for take-off.

There is no doubt that these and other — advances in aero — and aircraft design and — will be turned to good account in commercial air transport after the war. It is common knowledge that — engined Consolidated "Liberators" and other new military machines are being "ferried" across the Atlantic in little more than — hours' flying time, and ferry — have been "there and back" within 24 hrs.

Many long-distance services are likely to be operated at higher — than in the past, owing to the successful development of the — cabin, in which passengers can enjoy comfortable flight at "above the —" heights. The splendid four-engined Boeing "Stratoliners" were the first air liners to be equipped in this way.

Altitudes	Fighter	Pilots
Destructive	Fortress	Production
Eight	Four	Speeds
Engine	400	Supercharged
Engine	Hawker	300
Enormous	Liquid	Wartime
Fighter	Performance	Weather

When the positions for the 21 missing pieces have been found, the entire passage should be written out clearly, with the inserted words underlined, and addressed to "*Missing Words, Meccano Magazine, Binns Road, Liverpool 13.*" Competitors must take care to write their names and addresses on each sheet of their entry.

There will be two sections for Home and Overseas readers respectively, and in each prizes of 21/–, 10/6 and 5/– respectively will be awarded to the senders of the three best selections. In addition there will be consolation prizes for meritorious efforts, so every reader should send in his efforts, even if he is doubtful of the accuracy of some of his placings. Neatness and novelty will be taken into consideration in the event of ties for any of the prizes.

The closing date in the Home Section is 30th May and that in the Overseas Section 30th September.

What Stations are These?

Most readers, especially those who are members of the H.R.C., will be familiar with the names of the principal stations served by our railways. Station names indeed are fascinating to many railway enthusiasts, and this month we have taken advantage of the fact to provide a contest.

Below is a series of words or phrases, 15 in all, each of which provides a clue leading directly to the name of a British station. Some of the 15 puzzles are easy; others perhaps are not so easy, but all are interesting. In certain cases the name of the station is not that of the city or town in which it is situated, and in these, the name of the station should be followed by that of its position. As an example the first clue rather obviously leads to Victoria Station. In fact there are several stations of this name, but the best known is that in London and the solution therefore is "Victoria" (London).

1. **A great Queen.**
2. **A wide road in London.**
3. **Fields outside a place of worship.**
4. **A "town," but not in its own county.**
5. **Shares sometimes stand at it.**
6. **Trees on top of a hill.**
7. **Units of measurement.**
8. **A month.**
9. **Combines all the virtues.**
10. **A Border stronghold.**
11. **White eminence in the Midlands.**
12. **A circular tree.**
13. **Royal highway noted for its beauty.**
14. **A raised farming implement.**
15. **Almost string.**

Entrants should consider all the clues very carefully, and when they have decided what stations are represented they should write out the numbers of the clues on a postcard and against each number give the appropriate solution.

The Contest is divided into two sections, for Home and Overseas readers respectively, and in each prizes to the value of 21/–, 10/6 and 5/– will be awarded for the best solutions. Entries must be addressed "*Station Names Competition, Meccano Magazine, Binns Road, Liverpool 13.*" The closing dates are: Home Section, 30th May; Overseas Section, 30th September.

May Photographic Contest

In this month's photographic contest prizes are offered for the best photograph of any kind submitted. There are two conditions—1, that the photograph must have been taken by the competitor; and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired. We remind readers that they must not photograph any features of military importance.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed "*May Photo Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers.

In each section prizes of 15/– and 7/6 will be awarded together with consolation prizes for other good efforts. Closing dates: Home Section, 30th May; Overseas Section, 30th September.

Fireside Fun

Thirsty Customer (to waiter): "Have you any iced water?"
Waiter: "Yes sir, Oi have, but its warrum."

* * * *

"The time will come," shouted the speaker, "when women will get men's wages."
"Yes," said a man in the corner. "Next Friday night."

* * * *

"Yes, Cohen has left everything he had to the parish."
"Vat was it he left, then?"
"Five children."

* * * *

"Lend me £5, old man, and I'll be everlastingly indebted to you."
"Yes, that's what I'm afraid of."

* * * *

"In what condition was the patriarch Job at the end of his life?" asked a Sunday-school teacher.
"Dead" replied one of her class.

* * * *

Magistrate: "Where were you born?"
Prisoner: "Mile End, sir."
Magistrate: "Were you brought up there?"
Prisoner: "Often."

* * * *

"What do you mean, standing in the imaginary line of fire of the enemy?"
"I'm quite safe, sir, I'm standing behind an imaginary rock—30 ft. high!"

* * * *

One rainy day an Irishman was fishing with his line under a bridge.
"Why let your line go there?" he was asked by a companion.
"Sure, the fishes will be crowding in there out of the wet," he replied.

* * * *

Station Sergeant: "What, you back again?"
Prisoner: "Yes, any letters?"

* * * *

"It's outrageous to charge £5 for towing the car just a few miles."
"Never mind. He's earning it all. I've got the brakes on."

* * * *

Customer: "I haven't reached any ham in this sandwich yet."
Waiter: "Have another bite sir."
Customer, taking a large bite: "None yet."
Waiter: "Sorry, sir. You must have gone past it."

* * * *

Foreman: "Now then you, hurry up can't ye?"
Labourer: "All right, boss. Rome wasn't built in a day."
Foreman: "No, p'raps not: but I wasn't foreman o' that job."

"Sixpence for a tiny little dog like this! That's ridiculous!"
"Aye, it'd be cheaper to leave it and buy another at the other end."

* * * *

"My boy wants to be a racing motorist. What should I do?"
"Oh, I shouldn't stand in his way."

* * * *

Mother: "Tommy, that hole was not in your sock this morning."
Tommy: "Well, where was it then, mother?"

* * * *

Little Harold was drying a towel in the kitchen.
"Mother," he called out, "is it done when it's brown?"

* * * *

"Don't you know yet how to drive a nail without hitting your thumb?" asked Pat.
"How should I do it, then?"
"Easy. Hold the hammer handle with both hands."

* * * *

Pilot, to nice old lady enjoying her first flight: "It gets a bit cool at this height."
Old Lady: "It certainly does. I think you might turn the fan off for a bit."

* * * *

"There's old Jones. He's seen all the doctors in the town and they've all given him up."
"Incurable, eh!"
"No. He doesn't pay his bills."

* * * *

Augustus: "I don't know whether to be a barber or an author."
Friend: "Toss for it—heads or tales!"

* * * *

Shouting had been going on behind the closed door of the under-manager's office for quite ten minutes. The managing director was getting tired of it.
"What's all the noise about?" he inquired of the clerk.
"Mr. Brown is talking to London, sir."
"Then why on earth can't he use the telephone?"

* * * *

"Hey mister, you might give me one of them pigeons for my little Johnny before you throw them all away!"

BOYS–that's the big name in Cycle Lighting–it means supreme and never failing service.

Remember that and watch this space for simple hints on 'how to make your Lamps last longer'

MILLER

H. Miller & Co. Ltd.
(Makers of Lamps for over 50 years)

ASTON
BROOK ST.
BIRMINGHAM

SKYBIRDS

"ONCE BUILT, NEVER FORGOTTEN"

Indispensable for the Services–A.A. Units, Searchlights, Royal Observer Corps–Air Cadets and Roof Spotters.

SKYBIRDS—the FIRST and still the BEST 1/72nd TRUE-TO-SCALE Solid Model AIRCRAFT CONSTRUCTION.

These are complete sets of parts for assembling various types of Aircraft (owing to restrictions due to the war, the range is at present limited to the most popular types such as:

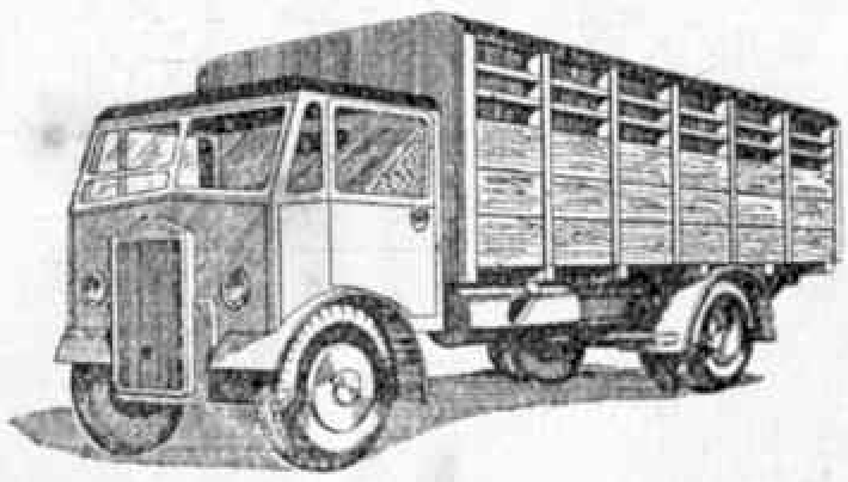
SPITFIRES, HURRICANES, TOMAHAWKS, LIGHTNINGS, etc.).

This fascinating hobby has captured the imagination of all persons who are interested in aviation and aeronautical modelling—if you make a "SKYBIRD" it will mean more to you than a mere shop-made replica for it will represent *a personal triumph*.

Join the **SKYBIRD League** of model aircraft constructors. There are over 16,000 registered members. For particulars, write (enclosing postage 2½d.)

SKYBIRDS
(Desk B)
9, SOUTHAMPTON PLACE
HOLBORN, LONDON W.C.1

SKYBIRDS
THE MOST POPULAR HOBBY TO-DAY!



C/4K: Cattle truck 6-ton kit with **Printastruct** cab, and completely assembled body. Detailed building instructions. **10/-**, post 4d.

WILSON LORRIES
THERE IS NO COMPARISON

The **PRINTASTRUCT** springing system—as simple as it is effective. Send for details 1d. Leaflet included in main catalogue.

6-PAGE CATALOGUE 6d. POST FREE

Distributors: Bassett-Lowke Ltd., Northampton.

D. MURRAY WILSON, Dept. M
Model Engineer, South Moreton, Didcot, Berks.

BRITISH MADE **ASTRA** TOYS OF QUALITY

MANUFACTURE SUSPENDED UNTIL AFTER THE WAR

ELECTRADIX

A.C./D.C. MAINS MAGNETS, 2 wound poles, 110 or 220 volts, **5/6.** Small 12-volt solenoids. 2 in. x ¼ in. plunger, **6/6.**

FRACTIONAL H.P. MOTORS, D.C. 50 volts shunt **1/20 h.p.,** K.B., 2,000 revs., **24/–.** 50/70 volts shunt, **1/6 h.p.,** Crypto, 1,500 revs., **27/6.** 110 volt shunt, **1/12 h.p.,** Croydon, 2,500 revs., **26/–.** 110 volts shunt, **1/2 h.p.,** Maudslay special, 4,000 revs., **45/–.** 220 volts shunt, **1/12 h.p.,** Croydon-Wilson, 2,400 revs., **30/–.** 240 volts shunt, **1/3 h.p.,** Wagner, 1,440 revs., **55/–.** 110 volts shunt, **1/6 h.p.,** Keith B., 1,250 revs., geared to 80, **45/–.**

FRACTIONAL A.C. 30 volts, **1/100 h.p.,** centi-midget induction, 58 revs., **15/–.** 220 volts, **1/25 h.p.,** 2,800 revs., **55/–.** Self-start induction, 230 volts, **¼ h.p.,** new Higgs, **84/6.**

DYNAMOS BARGAINS. Rotax, 6/12 volts 8½ amps., D.C., 3rd brush size, 8 in. x 4½ in., 11 lb., cost £10, unused, **15/–** (carriage 2/– extra). **G.E.C.** Double-current Dynamos, 6 volts and 600 volts, ball-bearings, 17 lb., as new, **25/–** (carriage 2/6 extra). **Charging Dynamos,** 16 volts, 15 amps., Leitner, 1,500 revs., **75/–.**

ALTERNATOR.—Perm. Magnet Alternator. Hand drive, 80 volts, 25 m/a. Useful tester, **10/6.**

8-WAY Lucas-Rotax Switch boxes, 8 levers and fuses for charging, etc., **3/6.** 6-way Push Button, R.A.F. switches, **2/9.**

THE CAMBRIDGE TOWNSEND BUZZER is the highest note and smallest Buzzer made, used by Government on wavemeters, and has ample platinum contacts. Ideal for key work, **10/–.**

Other Buzzers: Practice, bakelite-cased, **3/6.** Square brass-cased Buzzer, **4/6.** Heavy type bakelite cased, **5/6.** Few D111 Buzzers, multi windings, no contacts, **5/6.**

MORSE TAPPER SIGNAL KEYS. Type B.1., **5/–** Type B.2, back contacts, **9/6.** Type M, **6/6.** Type P.F., **9/6.** Type I.V., **12/6.**

MORSE RECORDERS for home training. Service model gramo drive. Morses direct on paper tape with dead key fitted, **£3/10/–.** G.P.O. transmitting Recorders, **£10** and **£12.**

ELECTRADIX RADIOS

19, Broughton Street, Queenstown Road, London S.W.8

Telephone: Macaulay 2159

MODEL RAILWAYS

BOOKS:

"L.N.E.R. Locomotives" **1/-,** by post **1/3**
"Modern L.M.S. Locos." **1/-,** by post **1/3**
"Scale Railway Modelling To-day" **8/6,** by post **9/-**
"History of the G.W.R." 1863-1921 **10/6,** by post **11/-**

SCALE MODEL BUILDINGS:	00	0
Platelayers' Huts	**2/9**	**5/6**
Contractors' Huts	**3/-**	—
Coal Offices	**3/6**	**6/6**
Concrete Coal Office	**4/9**	—
Water Towers	**6/-**	**13/6**

SCALE MODEL WOOD WATERLINE SHIPS:		
Submarine	8 in.	**2/-**
Corvette	5¾ in.	**3/-**
Aircraft Carrier	14 in.	**5/6**

Postage 4d. extra.

Tyldesley & Holbrook, 109 Deansgate, Manchester 3

Model Aeroplanes, Flying & Non-Flying Kits. All best makes stocked.

"Waterline," "Leyden," "Klown" Ship Kits.
"Tremo" Ship Models.
"Stamps," "Plasticine," "Lotts Chemistry."
Dopes, Cements, Wood, All Aeroplane Sundries.
Cigarette Cards. Books.
Owing to new regulations 3d. must be sent for our lists.

Have you any Dinky Toys, Meccano Sets, Hornby Train Sets, Dublo Train Sets, and similar goods to sell Second Hand. I will pay a fair price for good condition articles. No fancy prices, please. Pack your goods carefully and state prices wanted. CASH AT ONCE. Remember to pack the goods carefully.

George D. Campbell, Dept. M, 46, High Street, Dumfries

AMATEUR RADIO HANDBOOK

330 pages (40,000 copies sold). Recognised as Britain's Leading Short Wave Publication. Price 4/- by post.

Dept. MM, RADIO SOCIETY OF GREAT BRITAIN 16, Ashbridge Gardens, London N.13

BALL BEARING
ROLLER SKATES
FOR BOYS & GIRLS
Ages 7-15

HEDGE'S
CYCLE SPECIALISTS
NEATH, GLAM.

13/6
Post Free

WANTED. A modern gauge 00 toy railway (any size), also some gauge 0 locos with good hauling power. Moderate prices essential. Will deposit the money with the "M.M." if necessary. Offers to Box No. M71.

FROG scale non-flying model aeroplanes for sale. British and German, beautifully finished. Box No. M85.

STAMP ADVERTISEMENTS

—continued from page 192

NOT SOMETHING FOR NOTHING, BUT?

50 Stamps Free including Mint and Used Colonials, etc., to applicants for my famous ½d. Stamps and Cheap Sets. WITHOUT APPROVALS Price 9d.

S. H. FLEMING. Newhaven, Glyn Avenue, COLWYN BAY

FREE. 15 French Cols. to approval applicants. Send postage. K. Graham, 102, Brookside, Newtown, Carlisle.

FREE — STAMPS CATALOGUED 5/-
to applicants for ½d. approvals.
COX, 17, STONELEIGH PARK ROAD, EWELL

FREE! Long Dutch set to 1 g., including commems., high values (15 different) to approval applicants. Prices from one-tenth catalogue. 2½d. stamp please.

I. D. HAMILTON, B.P.A. 8, Lansdown Terrace, CHELTENHAM

For other Stamp Advertisements see pages 190 and 192.

Join the Well-Paid Ranks of the TRAINED MEN

MANY THOUSANDS MORE ARE URGENTLY NEEDED. PREPARE YOURSELF FOR A BETTER POSITION AND BETTER PAY

Ambitious men everywhere have succeeded through I.C.S. Home-Study Courses. So also can you. We offer you the benefit of our 51 years' matchless experience as the creative pioneers of postal instruction.

51 YEARS OF SERVICE

If you need technical training, our advice on any matter concerning your work and your career is yours for the asking—free and without obligation. Let us send you full information regarding the subject in which you are specially interested. DON'T DELAY. Make "ACTION" your watchword.

The successful man does to-day what the failure INTENDS doing to-morrow. Write to us TO-DAY.

The I.C.S. offer Courses of Instruction in a wide range of subjects, including:

Accountancy
Advertising
Aeronautical Engineering
Aero Engine Fitting
Aero Fitting and Rigging
Aeroplane Designing
Air-Conditioning
Architecture
Architectural Drawing
Boilermaking
Book-keeping
Building Construction
Building Contracting
Business Training
Business Management
Cabinet Making
Carpentry
Chemical Engineering
Civil Engineering
Clerk of Works
Colliery Management
Commercial Art
Concrete Engineering
Cotton Manufacturing
Diesel Engineering
Draughtsmanship
Drawing Office Practice
Electrical Engineering
Engineer in Charge
Eng. Shop Practice
Fire Engineering
Fitting and Turning
Foundry Work
Garage Management
Gas-Power Engineering
Ground Engineer
Heating and Ventilating
Hydraulic Engineering
Insurance
Joinery
Journalism
Machine Designing
Machine-Tool Work
Marine Engineering
Mechanical Drawing
Mechanical Engineering
Mine Electrician
Mine Surveying
Mining Engineering
Motor Engineering
Motor Mechanic
Moulding
Patternmaking
Power-House Attendants
Quantity Surveying
Radio Engineering
Radio Servicing
Refrigeration
Salesmanship
Sanitary Engineering
Secretarial Work
Sheet-Metal Work
Steam Engineering
Structural Steelwork
Surveying
Telegraph Engineering
Telephone Engineering
Templating
Textile Designing
Toolmaking
Turner
Welding, Gas & Elec.
Woodworking
Woollen Manufacturing
Works Engineering
Works Management

And most of the Technical, Professional, Civil Service and Matriculation Exams.

YOU MAY USE THIS COUPON

(Penny stamp on unsealed envelope)

INTERNATIONAL CORRESPONDENCE SCHOOLS LTD.

Dept. 218, International Buildings, Kingsway, London W.C.2

Please send me the Syllabus of your Courses in .....

Name ..... Age .....

Address .....

.....

ICS

This Month's Special Articles

	Page
Air News	180
Books to Read	172
Club and Branch News	186
Competitions Page	195
Engineering News	169
Famous Inventors: Thomas A. Edison—I	176
Fine Goods Run to York	170
Fireside Fun	196
From Our Readers	179
Hornby Railway Company Pages	187–9
In War-Time Washington	166
Island Bird Sanctuary	162
Meccano Model-Building Competition	183
New Meccano Models	182
Photography	178
Railway News	174
R.A.F. Desert Salvage Crews	165
Stamp Collecting	191
Stamp Gossip	193
Stripes and Bars in the U.S. Army	173
Suggestions Section	184

MECCANO MAGAZINE

Registered at G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICE:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Publication Date. The "*M.M.*" is published on the 1st of each month.

Readers' Sales and Wants. Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/–. Cash with order. Editorial and Advertising matters should not be dealt with on the same sheet of paper.

Readers' advertisements are published as soon as possible; inclusion in the first issue after receiving them cannot be guaranteed.

Small Advertisements. 1/8 per line (average seven words to the line), or 20/– per inch (average 12 lines to the inch). Cash with order.

Display. Quotations for space bookings, and latest net sale figures, will be sent on request.

READERS' SALES AND WANTS

SALES

Exchange "M.M's." 1941 in excellent condition for No. 1 Clockwork Motor.—Nisbet Clews, 4, Thrushcraig Crescent, Paisley, Renfrewshire.

Sale. 11 Railway Magazines, 7/-; 21 "M.M's." 7/-; Postcard Album (capacity 500) new, 5/-; 82 Railway Locomotive Photos, 15/-.—R. Gardner, 10, Acacia Avenue, Yiewsley, Middlx.

Trains, Cines, Meccano, Games, Toys for sale. Stamp for list—Sutton, 117, Chelmsford Road, South Woodford, E.18.

Sale. Over 1,100 Colonials, catalogued S.G. over £20. In "New Ideal" and "Utile" albums. Together or loose lots. Offers—Mackay, Exbury, Exeter Rd., Ivybridge, Devon.

Sale. Electric Gauge "O" Royal Scot, "Bramham Moor," two Tanks, large quantity of track, rolling stock and accessories. For particulars send stamped addressed envelope.—S. G. Ayres, 43a, The Embankment, Bedford.

Sale. No. T6M Transformer and 6-volt resistance controller, in perfect condition. — Apply 26, Scarsdale Ave., Allestree, Nr. Derby.

For Sale. Twin Trix Double Transformer, 100-130 volt, as new £1.—Maltby, 37, Sutton Oak Rd., Sutton Coldfield.

WANTS

Wanted. Gauge "O" Electric Rails and Points, double track if possible; must be in good condition.—Gainey, 28, Curzon Street., Calne, Wiltshire.

Wanted. Hornby 20 volt Transformer No. T22M, for 240 volt mains.—Frost, 73, Fishers Green Rd., Stevenage, Herts.

Wanted. Air Rifle. Send particulars to—Hoskins, 7, Inglefield Ave., Heath, Cardiff.

Wanted. Webley Air Pistol, any model. State price to—D. Brewer, 89, Tavistock Avenue, St. Albans, Herts.

Wanted. Red/Green 4-7 Manual; also Super Model Leaflets 15, 22, 30, 37.—Fletcher, 17, The Quadrant, Cottingham Rd., Hull.

Wanted. Six 2 in. Motor Tyres and two 2 in. Pulley Wheels, must be in good condition.—Chatfield, "Meadowcroft," Ash Bank, Bucknall, Stoke-on-Trent, Staffs.

Wanted. Electron Parts. Good condition.—Quennell, 145, Bradbourne Park Road, Sevenoaks, Kent.

Wanted. Hornby Corridor Coach, L.N.E.R.—Smith, Brookside, Mymms Drive, Brookmans Park, Hatfield, Herts.

WANTS—*continued*

Wanted. Meccano Gears Nos. 25a, 26, 27, 27a, 29, 31, 32, must be in good condition. Write—47, Melbourne St., Derby.

Wanted. Air Rifle. Good make. In good condition. Diana or Webley preferred.—Hurwood, Rose Villa, Scorton, Yorks.

Wanted. "Meccano Magazines," October, December, 1941.—King, Gavarnie, Wise Lane, Mill Hill, N.W.7.

Wanted. Hornby G.W.R. County Locomotive and Tender; also No. 1 Special G.W.R. Locomotive. Good condition of body not necessary.—Raywood, 185B, Westfield Road, Southsea, Hants.

500 Meccano Nuts and Bolts. Price to—60, Conway St., Long Eaton, nr. Notts.

Wanted. Two ¾ in. dia. Pinion Wheels, two ¾ in. dia. Contrate Wheels, or four Bevel Gears No. 30.—Whitaker, "Kledang," Sandon Road, Grantham.

Wanted. Gauge "O" Steam Engine, capable of taking 2 ft. radius curves. 15/– or near.—Nixon, 15, Selwyn Crescent, Welling, Kent.

Wanted. "Meccano Magazines," Jan. Feb. 1941.—Apply quoting price.—Walmsley, Hutton-le-Hole, Yorkshire.

Wanted. Dinky Toys. Town Sedans, Racing Cars or Six-wheeled Wagons are not acceptable. Apply—N. Keen, 15, Grove Road, Lode Lane, Solihull, Warwickshire.

Wanted. "M.M." for May 1928; January 1926; Feb., Mar., Apr., May, June, July, 1924.—Smith, "Dilwyn", Marlbrook Lane, Bromsgrove, Worcs.

Wanted. Cinematograph Projector, Films etc.—Roth, 19, Greene Walk, Berkhamsted, Herts.

Wanted. 9.5 mm. Cinematograph Films, any length or subject.; also Bulb for Pathescope "Baby" Projector.—A. Ellis, 351, Willerby Road, Hull, Yorks.

Wanted. "M.M.'s" for year 1934 complete, good condition; also Meccano Gears.—Dosson, Crossfields, Cannington, Bridgwater.

Wanted. Red/Green Meccano urgently; also 6-volt Transformers for 230 A.C. and 6-volt Electric Motors; good condition essential; good payment given; details to—Rubin, 12, Abbey Court, Abbey Road, London N.W.8.

Wanted. Two Ring Frames for Rollers, two ¾" Pinions and four Face Plates, in good condition. State price—Newman, "Alvear", The Crescent, Hadleigh, Essex.

Wanted. Meccano Gear Wheels and Pinions.—Taylor, 23, Borden Road, Glasgow, W.3.

AEROPLANE PHOTOS.

AEROPLANES. New Lists now ready. **List 15W** Warplanes, **List 14C** Commercial Aircraft. Price 5d. each or 9d. for both (post free).

RAILWAYS. List No. 18. 2,500 titles of locomotives and trains (24 pages). Price 5d.

SHIPS. List No. 5. 1,000 titles of naval vessels, liners, sail-ships, etc. 4d. (post free).

Any one of above lists sent with specimen photograph and copy of "R.P. News," 10d. (post free). All photographs size 5½ × 3½ in. 5/– per doz.

"WARPLANES No. 4"

"British & American Aeroplanes"

Drawings, photographs and constructional details of 22 famous aeroplanes. Price 1/6.

WARPLANES No. 1, "IDENTIFICATION OF BRITISH AND ENEMY AIRCRAFT." Drawings, photographs, constructional details, etc. Price 1/3.

WARPLANES No. 2, "INTERIOR DETAILS." Sectional drawings, photographs and descriptive matter of eleven famous aircraft. Price 1/6.

WARPLANES No. 3, "THE BOOK OF THE SPITFIRE." Generously illustrated. Price 1/3.

"AMERICAN AIRCRAFT DESIGNATIONS." Explaining the numbering and code letters of U.S.A. aeroplanes. Price 5d. (post free).

"R.P. NEWS" issued (about) every month for all interested in Aeroplanes, Ships and Railways. 1/– for six issues (post free). Specimen copy 2d.

"LUMOS" EPISCOPE for direct projection in colour of photographs, magazine illustrations, postage stamps, etc. £5/5/–. Send for descriptive leaflet.

Real Photographs Co. Ltd., Southport

BOND'S

Limited Supplies are still available of

Model Railway Parts
Model Yachts
Model Ships' Fittings
Model Aeroplane Kits

Let us know your requirements and we will be pleased to quote for parts we can supply from stock

BOND'S O' EUSTON ROAD LTD.
357, Euston Road, London N.W.1
Telephone EUSton 5441-2. *Est. 1887*

WHY NOT DO YOUR OWN DEVELOPING & PRINTING?

Have you sent for a copy of JOHNSONS FREE BOOK?

This gives you full instructions how to develop your films correctly and how to make bromide and contact "gaslight" prints. Johnsons way is simple but very sure. Use AZOL for your films and AMIDOL for developing your prints. Write to-day to E/M Dept. for full details, including free Handbook on Home Photography.

SPECIAL OFFER!

For a 2/3 P.O. Johnsons will send you post free (G.B. only) a trial set of Chemicals, including 1-oz. bottle of AZOL, to develop eight spools 2½ in. by 3¼ in., 4-oz. tin ACID-FIXING, making 30–60 oz solution, one packet AMIDOL DEVELOPER, enough for 2 to 3 dozen bromide or gaslight prints. Address E/M Dept.

Johnsons
OF HENDON

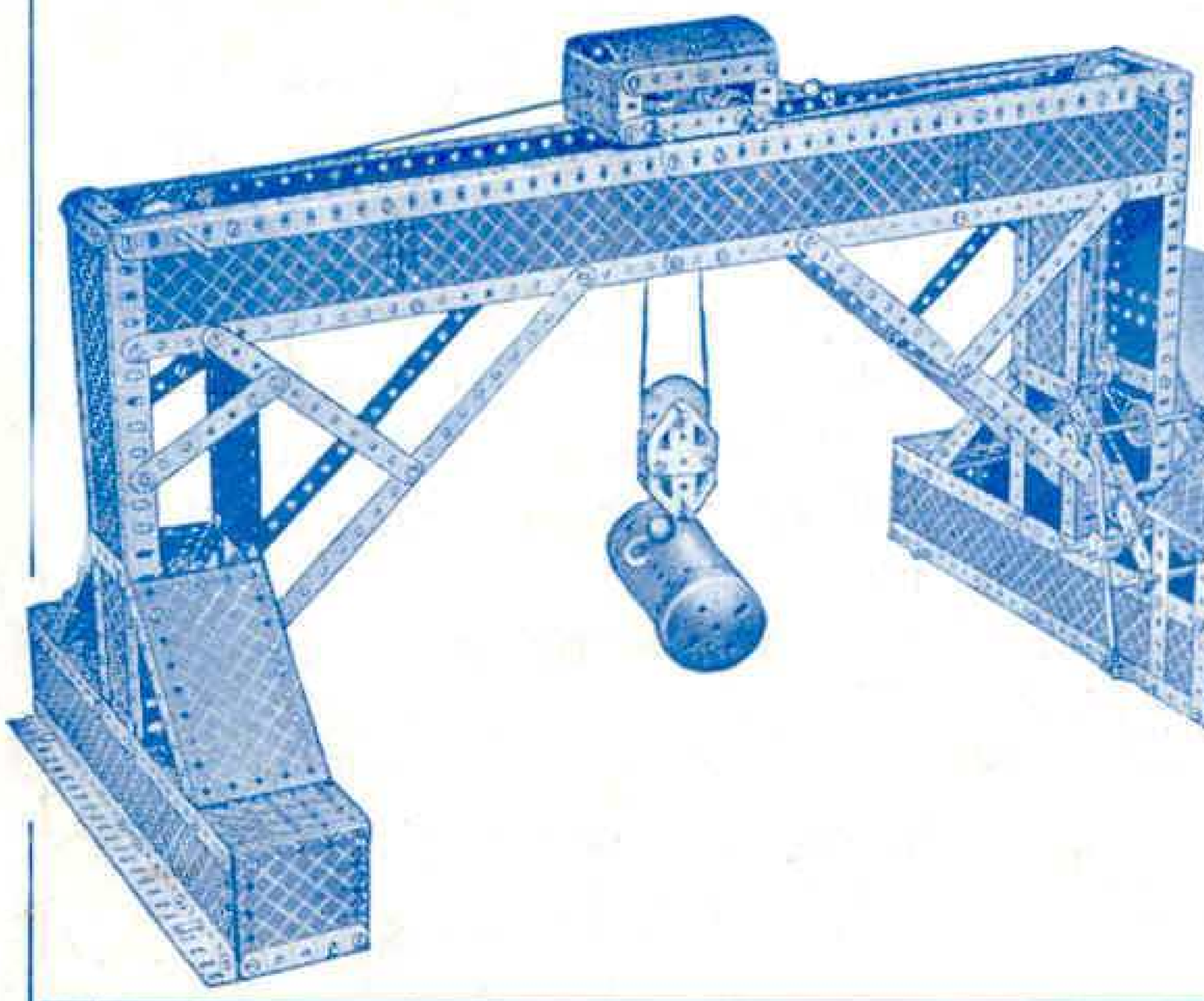
JOHNSON & SONS Manufacturing Chemists LTD., HENDON, N.W.4

MECCANO

No other hobby touches Meccano for fun, interest and excitement. It's thrilling to build splendid models of bridges, cranes, great towers with lifts, locomotives, machine tools and scores of other engineering marvels—and to make the finished models work just like the real thing.

The world's best hobby for boys

With Meccano there is always something new to make and something new to invent.



This overhead travelling crane is a typical Meccano working model.

MECCANO LIMITED - BINNS ROAD - LIVERPOOL 13

PUBLISHED BY MECCANO LTD., BINNS ROAD, LIVERPOOL 13, ENGLAND
Printed by John Waddington Ltd., Leeds and London